RDR-HX820/HX825

RMT-D230P/D231P

SERVICE MANUAL

AEP Model

RDR-HX820/HX825

Self Diagnosis Supported model

Photo: RDR-HX820
RMT-D230P

DVD+ReWritable · VIDEO/R/RW · COMPACT disc DIGITAL VIDEO · ShowView® · GUIDEplus+ GEMSTAR for RDR-HX825 · HDMI HIGH-DEFINITION MULTIMEDIA INTERFACE

SPECIFICATIONS

System

Laser: Semiconductor laser

Channel coverage:

PAL/SECAM (B/G, D/K, I, L)
VHF: E2 to E12, R1 to R12, F2 to F10, Italian A to H, Ireland A to J, South Africa 4 to 13
UHF: E21 to E69, R21 to R69, B21 to B69, F21 to F69
CATV: S01 to S05, S1 to S20, France B to Q
HYPER: S21 to S41

The above channel coverage merely ensures the channel reception within these ranges. It does not guarantee the ability to receive signals in all circumstances.

Video reception: Frequency synthesizer system

Audio reception: Split carrier system

Aerial out: 75-ohm asymmetrical aerial socket

Timer: Clock: Quartz locked/Timer indication: 24-hour cycle (digital)/ Power back-up duration: 1 hour

Video recording format: MPEG-2, MPEG-1

Audio recording format/applicable bit rate: Dolby Digital 2 ch
256 kbps/128 kbps (in EP and SLP mode)

Inputs and outputs

LINE 2 OUT
(AUDIO): Phono jack/2 Vrms/10 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.3 Vp-p (PAL)

LINE 2 IN
(AUDIO): Phono jack/2 Vrms/more than 22 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.3 Vp-p (PAL)

LINE 1 – TV: 21-pin
CVBS IN/OUT
S-Video/RGB OUT (upstream)

LINE 3/DECODER: 21-pin
CVBS IN/OUT
S-Video/RGB IN
S-Video OUT (downstream)
Decoder

DV IN: 4-pin/i.LINK S100

DIGITAL OUT (OPTICAL):
Optical output jack/–18 dBm (wave length: 660 nm)

DIGITAL OUT (COAXIAL): Phono jack/ 0.5 Vp-p/75 ohms

COMPONENT VIDEO OUT (Y, P_B/C_B, P_R/C_R):
Phono jack/Y: 1.0 Vp-p,
P_B/C_B: 0.7 Vp-p, P_R/C_R: 0.7 Vp-p

G-LINK: mini jack
(for RDR-HX825 models only)

HDMI OUT: HDMI 19pin-Standard Connector

General

Power requirements: 220-240 V AC, 50/60 Hz

Power consumption: 46 W

Dimensions (approx.):
430 × 73 × 328 mm (width/height/ depth) incl. projecting parts

Hard disk drive capacity: 160 GB

Mass (approx.): 4.7 kg

Operating temperature: 5ºC to 35ºC

Operating humidity: 25% to 80%

Supplied accessories:

Mains lead (1)
Aerial cable (1)
Remote commander (remote) (1)
Set top box controller (1)
(for RDR-HX825 models only)
R6 (size AA) batteries (2)

Specifications and design are subject to change without notice.

Compatible colour systems

This recorder is designed to record using the PAL colour system and play back using the PAL or NTSC colour systems.
The signals of the SECAM colour system can be received or recorded but played back in the PAL colour system only. Recording of video sources based on other colour systems cannot be guaranteed.

DVD RECORDER

SONY®

WARNING!!

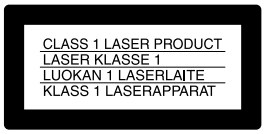
WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:

The use of optical instrument with this product will increase eye hazard.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Unleaded solder

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350°C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

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SERVICE NOTE

1. DISK REMOVAL PROCEDURE IF THE TRAY CANNOT BE EJECTED (FORCED EJECTION)

1. Remove the upper case.
2. Insert the stiff wire in the hole and eject the tray.

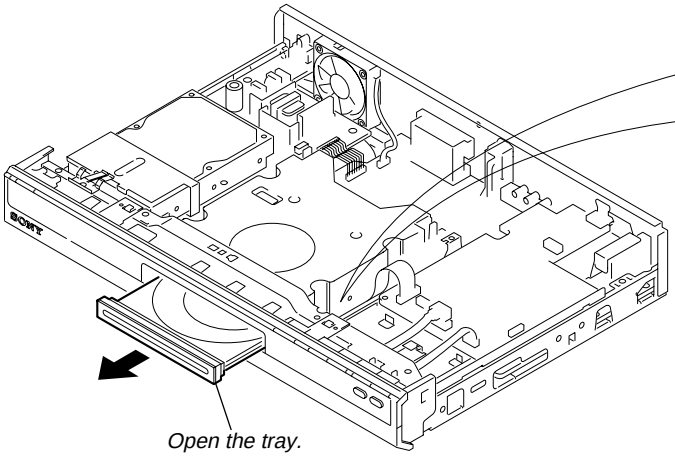


Fig. 1

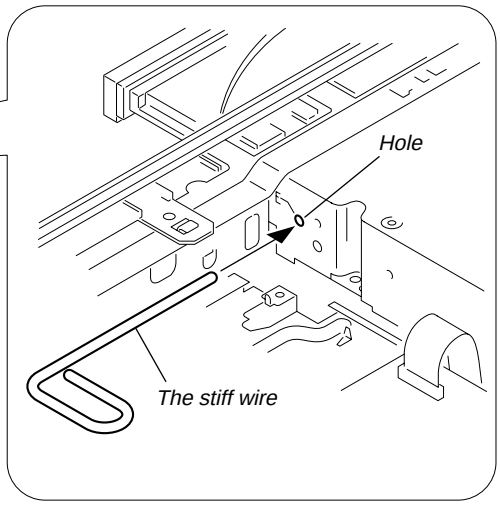


Fig. 2

NOTES DURING THE FORCED EJECTION

1. If the forced ejection is executed while a blank disc media (DVD±RW, ±R) exists on the tray

• Insert a DVD-ROM (DVD test disc, DVD software available on the market, or the like) in the tray and then close the tray.

Note1: If you close the tray while it is empty, ejection of the tray becomes impossible.

Note2: If you close the tray with a CD disc inserted in it, the CD can be ejected. However, if you close the tray while it is empty, there can be a case that ejection of the tray becomes impossible.

Note3: Even if you replace the DVD drive unit while the tray remains under the state as described above, the situation cannot be improved.

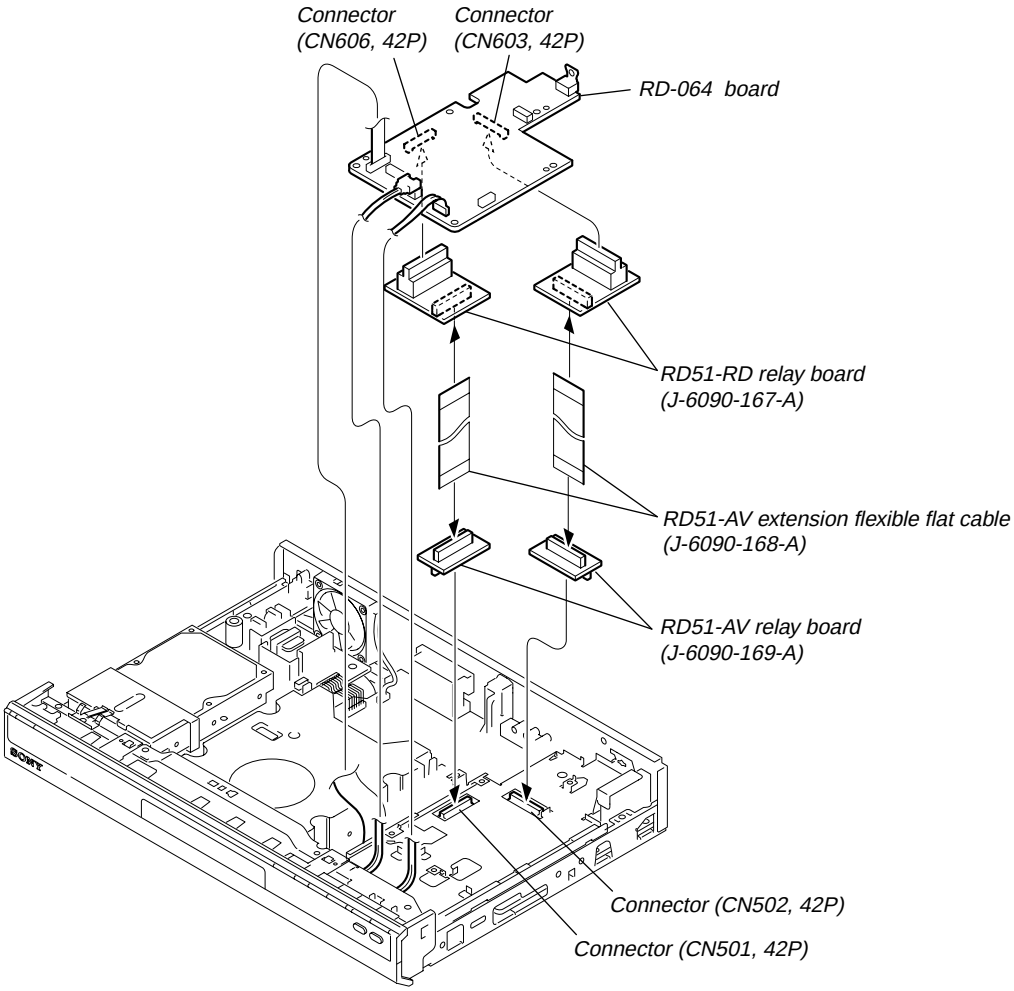
2. If the tray cannot be ejected while the disc is not inserted

• Execute the forced ejection.

• Insert a DVD-ROM (DVD test disc, DVD software available on the market, or the like) on the tray and try to close the tray. (There are cases that it recovers the trouble.)

3. Contents of forcedly ejected blank disc media (DVD±RW, ±R) can be damaged. (There can be a case that initialization is also impossible.)

2. BOARDS CONNECTION



This section is extracted from instruction manual.
(RDR-HX825 : 2-886-040-E1 (1))

SECTION 1 GENERAL

WARNING

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.
The mains lead must be changed only at a qualified service shop.

CLASS 1 LASER PRODUCT
LASER KLASSE 1
クラス１レーザ製品

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the laser protective housing inside the enclosure.

CAUTION

The use of optical instruments with this product will increase eye hazard. As the laser beam used in this DVD recorder is harmful to eyes, do not attempt to disassemble the cabinet.
Refer servicing to qualified personnel only.

This label is located on the laser protective housing inside the enclosure.

Precautions

- This unit operates on 220 – 240 V AC, 50/60 Hz. Check that the unit's operating voltage is identical with your local power supply.
- To prevent fire or shock hazard, do not place objects filled with liquids, such as vases, on the apparatus.
- Install this system so that the mains lead can be unplugged from the wall socket immediately in the event of trouble.

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Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems)

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local Civic Office, your household waste disposal service or the shop where you purchased the product.

Precautions

This equipment has been tested and found to comply with the limits set out in the EMC Directive using a connection cable shorter than 3 metres.

On safety

Should any solid object or liquid fall into the cabinet, unplug the recorder and have it checked by qualified personnel before operating it any further.

About the hard disk drive

The hard disk has a high storage density, which enables long recording durations and quick access to the written data. However, it can easily be damaged by shock, vibration or dust, and should be kept away from magnets. To avoid losing important data, observe the following precautions.

- Do not apply a strong shock to the recorder.
- Do not place the recorder in a location subject to mechanical vibrations or in an unstable location.
- Do not place the recorder on top of a hot surface, such as a VCR or amplifier (receiver).
- Do not use the recorder in a place subject to extreme changes in temperature (temperature gradient less than 10 °C/hour).
- Do not move the recorder with its mains lead connected.
- Do not disconnect the mains lead while the power is on.
- When disconnecting the mains lead, turn off the power and make sure that the hard disk drive is not operating (the clock is displayed in the front panel display for at least 30 seconds and all recording or dubbing has stopped).
- Do not move the recorder for one minute after you have unplugged the mains lead.
- Do not attempt to replace or upgrade the hard disk by yourself, as this may result in malfunction.

If the hard disk drive should malfunction, you cannot recover lost data. The hard disk drive is only a temporary storage space.

About repairing the hard disk drive

- The contents of the hard disk drive may be checked in case of repair or inspection during a malfunction or modification. However, the contents will not be backed up or saved by Sony.
- If the hard disk needs to be formatted or replaced, it will be done at the discretion of Sony. All contents of the hard disk drive will be erased, including contents that violate copyright laws.

On power sources

- The recorder is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the recorder itself has been turned off.
- If you are not going to use the recorder for a long time, be sure to disconnect the recorder from the wall outlet. To disconnect the AC power cord (mains lead), grasp the plug itself; never pull the cord.

On placement

- Place the recorder in a location with adequate ventilation to prevent heat build-up in the recorder.
- Do not place the recorder on a soft surface such as a rug that might block the ventilation holes.
- Do not place the recorder in a confined space such as a bookshelf or similar unit.
- Do not place the recorder in a location near heat sources, or in a place subject to direct sunlight, excessive dust, or mechanical shock.
- Do not place the recorder in an inclined position. It is designed to be operated in a horizontal position only.
- Keep the recorder and discs away from equipment with strong magnets, such as microwave ovens, or large loudspeakers.
- Do not place heavy objects on the recorder.

On recording

Make trial recordings before making the actual recording.

On compensation for lost recordings

Sony is not liable and will not compensate for any lost recordings or relevant losses, including when recordings are not made due to reasons including recorder failure, or when the contents of a recording are lost or damaged as a result of recorder failure or repair undertaken to the recorder. Sony will not restore, recover, or replicate the recorded contents under any circumstances.

➡continued

Copyrights

- Television programmes, films, video tapes, discs, and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization from the cable television transmitter and/or programme owner.
- This product incorporates copyright protection technology that is protected by U.S. patents and other intellectual property rights. Use of this copyright protection technology must be authorized by Macrovision, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision. Reverse engineering or disassembly is prohibited.

Copy guard function

Since the recorder has a copy guard function, programmes received through an external tuner (not supplied) may contain copy protection signals (copy guard function) and as such may not be recordable, depending on the type of signal.

IMPORTANT NOTICE

Caution: This recorder is capable of holding a still video image or on-screen display image on your television screen indefinitely. If you leave the still video image or on-screen display image displayed on your TV for an extended period of time you risk permanent damage to your television screen. Plasma display panels and projection televisions are especially susceptible to this.

If you have any questions or problems concerning your recorder, please consult your nearest Sony dealer.

About this manual

- In this manual, the internal hard disk drive is written as "HDD," and "disc" is used as a general reference for the HDD, DVDs, or CDs unless otherwise specified by the text or illustrations.
- Icons, such as DVD, listed at the top of each explanation indicate what kind of media can be used with the function being explained.
- Instructions in this manual describe the controls on the remote. You can also use the controls on the recorder if they have the same or similar names as those on the remote.
- The on-screen display illustrations used in this manual may not match the graphics displayed on your TV screen.
- The explanations regarding DVDs in this manual refer to DVDs created on this recorder. The explanations do not apply to DVDs that are created on other recorders and played back on this recorder.

Quick Guide to Disc Types

Recordable and playable discs

Type		Disc Logo	Icon used in this manual	Formatting (new discs)	Compatibility with other DVD players (finalising)
Hard disk drive (internal)		HDD	HDD	Formatting unnecessary	Dub HDD contents to a DVD to play on other DVD players
DVD+RW		DVD+ReWritable DVD+ReWritable High Speed	+RW	Automatically formatted in +VR mode (DVD+RW VIDEO)	Playable on DVD+RW compatible players (automatically finalised)
DVD-RW	VR mode	DVD-RW	-RWVR	Format in VR mode (page 33)	Playable only on VR mode compatible players (finalisation unnecessary)
	Video mode	DVD-RW RW 2	-RWVideo	Format in Video mode (page 33)	Playable on most DVD players (finalisation necessary) (page 41)
DVD+R DVD+R DL		DVD+R DVD+R DL	+R	Automatically formatted in +VR mode (DVD+R VIDEO)	Playable on most DVD players (finalisation necessary) (page 41)
DVD-R	VR mode	DVD-R R4.7	-RVR	Format in VR mode (page 33)*1 Formatting is performed using the "Disc Information" display.	Playable only on DVD-R in VR mode compatible players (finalisation necessary) (page 41)
	Video mode		-RVideo	Automatically formatted in Video mode	Playable on most DVD players (finalisation necessary) (page 41)

Usable disc versions (as of August 2006)
- 8x-speed or slower DVD+RWs
- 6x-speed or slower DVD-RWs (Ver.1.1, Ver.1.2 with CPRM*2)
- 16x-speed or slower DVD+Rs
- 16x-speed or slower DVD-Rs (Ver.2.0, Ver.2.1 with CPRM*2)
- 8x-speed or slower DVD+R DL (Double Layer) discs

"DVD+RW," "DVD-RW," "DVD+R," "DVD+R DL," and "DVD-R" are trademarks.

*1 When an unformatted DVD-R is inserted into this recorder, it is automatically formatted in Video mode. To format a new DVD-R in VR mode, format using the "Disc Information" display (page 33).

*2 CPRM (Content Protection for Recordable Media) is a coding technology that protects copyrights for images.

Discs that cannot be recorded on
- 8 cm discs
- DVD-R DL (Dual Layer) discs
- DVD-RAMs

→continued

Playable discs

Type	Disc Logo	Icon used in this manual	Characteristics
DVD VIDEO	DVD VIDEO	DVD	Discs such as movies that can be purchased or rented This recorder also recognizes DVD-RAMs and DVD-R Dual Layer (Video mode) discs as DVD Video compatible discs. If the DVD-RAM has a removable cartridge, remove the cartridge before playback.
VIDEO CD	COMPACT disc DIGITAL VIDEO	VCD	VIDEO CDs or CD-Rs/CD-RWs in VIDEO CD/Super VIDEO CD format
CD	COMPACT disc DIGITAL AUDIO	CD	Music CDs or CD-Rs/CD-RWs in music CD format
DATA DVD	—	DATA DVD	DVD+RWs/DVD+Rs/DVD-RWs/DVD-Rs/DVD-ROMs containing either JPEG image files or DivX video files
DATA CD	—	DATA CD	CD-ROMs/CD-Rs/CD-RWs containing either MP3 audio tracks, JPEG image files or DivX video files
8 cm DVD+RW/ DVD-RW/DVD-R	—	—	8 cm DVD+RW, DVD-RW, and DVD-R recorded with a DVD video camera (Still images recorded with a DVD video camera cannot be played.)

"DVD VIDEO" and "CD" are trademarks.

DivX, DivX Certified, and associated logos are trademarks of DivX, Inc. and are used under license.
DivX® is a video file compression technology, developed by DivX, Inc.

Discs that cannot be played
- PHOTO CDs
- CD-ROMs/CD-Rs/CD-RWs that are recorded in a format different from the formats mentioned in the table above.
- Data part of CD-Extras
- DVD-ROMs/DVD+RWs/DVD-RWs/DVD+Rs/DVD-Rs that do not contain DVD Video, DivX video or JPEG image files.
- DVD Audio discs
- Cartridge-only type DVD-RAMs and/or DVD-RAMs that do not contain DVD Video.
- HD layer on Super Audio CDs
- DVD VIDEOs with a different region code (page 11).
- DVDs that were recorded on a different recorder and not correctly finalised.

Maximum recordable number of titles

Disc	Number of titles*
HDD	300
DVD-RW/DVD-R	99
DVD+RW/DVD+R	49
DVD+R DL	49

* The maximum length for one title is eight hours.

Note on playback operations of DVD VIDEOs/VIDEO CDs
Some playback operations of DVD VIDEOs/VIDEO CDs may be intentionally set by software producers. Since this recorder plays DVD VIDEOs/VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. See the instructions supplied with the DVD VIDEOs/VIDEO CDs.

Region code (DVD VIDEO only)
Your recorder has a region code printed on the rear of the unit and will only play DVD VIDEOs (playback only) labelled with identical region codes. This system is used to protect copyrights.
DVD VIDEOs labelled (ALL) will also play on this recorder.
If you try to play any other DVD VIDEO, the message "Playback prohibited by region code." will appear on the TV screen.
Depending on the DVD VIDEO, no region code indication may be labelled even though playing the DVD VIDEO is prohibited by area restrictions.

Music discs encoded with copyright protection technologies
This product is designed to play back discs that conform to the Compact Disc (CD) standard.
Recently, various music discs encoded with copyright protection technologies are being marketed by some record companies. Please be aware that among those discs, there are some that do not conform to the CD standard and may not be playable by this product.

Note on DualDiscs
A DualDisc is a two sided disc product which mates DVD recorded material on one side with digital audio material on the other side. However, since the audio material side does not conform to the Compact Disc (CD) standard, playback on this product is not guaranteed.

Notes
- Some DVD+RWs/DVD+Rs, DVD-RWs/DVD-Rs, DVD-RAMs, or CD-RWs/CD-Rs cannot be played on this recorder due to the recording quality or physical condition of the disc, or the characteristics of the recording device and authoring software. The disc will not play if it has not been correctly finalised. For more information, see the operating instructions for the recording device.
- You cannot mix VR mode and Video mode on the same DVD-RW. To change the disc's format, reformat the disc (page 43). Note that the disc's contents will be erased after reformatting.
- You cannot shorten the time required for recording even with high-speed discs.
- It is recommended that you use discs with "For Video" printed on their packaging.
- You cannot add new recordings to DVD+Rs, DVD-Rs, or DVD-RWs (Video mode) that contain recordings made on other DVD equipment.
- In some cases, you may not be able to add new recordings to DVD+RWs that contain recordings made on other DVD equipment. If you do add a new recording, note that this recorder will rewrite the DVD menu.
- You cannot edit recordings on DVD+RWs, DVD-RWs (Video mode), DVD+Rs, or DVD-Rs that are made on other DVD equipment.
- If the disc contains PC data unrecognizable by this recorder, the data may be erased.
- You may not be able to record on some recordable discs, depending on the disc.

Hooking Up the Recorder

Follow steps 1 through 6 to hook up and adjust the settings of the recorder. Do not connect the mains lead until you reach "Step 4: Connecting the Mains Lead" on page 21.

Notes

- See "Specifications" (page 121) for a list of supplied accessories.
- Plug in cords securely to prevent unwanted noise.
- Refer to the instructions supplied with the components to be connected.
- You cannot connect this recorder to a TV that does not have a SCART or video input jack.
- Be sure to disconnect the mains lead of each component before connecting.

Step 1: Connecting the Aerial Cable and Set Top Box Controller

Select one of the following aerial hookups. Do NOT set "Line3 Input" of the "Scart Setting" to "Decoder" in the "Video" setup (page 103) when making connection A or B.

If you have	Hookup
Set top box receiver with an aerial output (or aerial and SCART output)	A (page 14)
Set top box receiver with a SCART output only	B (page 15)
No set top box receiver	C (page 16)

If the set top box receiver can output RGB signals

This recorder accepts RGB signals. If the set top box receiver can output RGB signals, connect the TV SCART connector on the set top box receiver to the LINE 3/DECODER jack, and set "Line3 Input" of "Scart Setting" to "Video/RGB" in the "Video" setup (page 103). Note that this connection and setup disable the SMARTLINK function. If you want to use the SMARTLINK function with a compatible set top box receiver, see the instructions supplied with the set top box receiver.

If you want to use the Synchro Rec function

A SCART connection between the set top box receiver and the recorder is necessary to use the Synchro-Recording function. See "Recording from connected equipment with a timer (Synchro Rec)" on page 63.

Set "Line3 Input" of "Scart Setting" in the "Video" setup (page 103) according to the specifications of your set top box receiver. See your set top box receiver's instructions for more information.

Using the set top box receiver control function

The set top box receiver control function can be used with hookup A or B. It allows the recorder to control a set top box receiver via the supplied set top box controller. The recorder controls programme positions on the set top box receiver for timer recording. You can also use the recorder's remote control to change programme positions on the set top box receiver whenever the set top box receiver and recorder are turned on.

To use the set top box receiver control function, you need to connect the set top box controller (page 25). After setting up the set top box receiver control, check that the recorder can correctly control the set top box receiver (page 26).

Notes

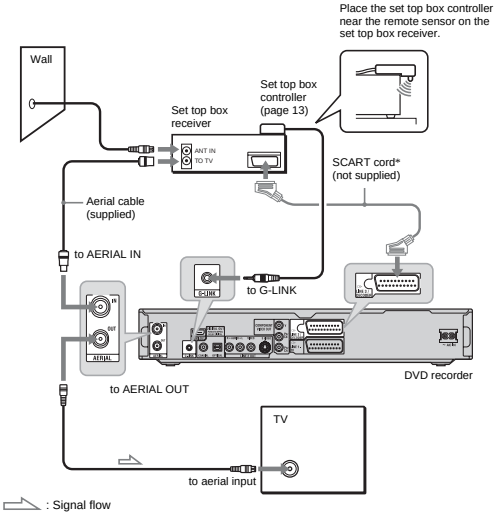
- If your aerial is a flat cable (300-ohm twin lead cable), use an external aerial connector (not supplied) to connect the aerial to the recorder.
- If you have separate cables for AERIAL antennas, use an AERIAL UHF/VHF band mixer (not supplied) to connect the aerial to the recorder.
- Synchro-Recording does not work with some tuners. For details, see the tuner's operating instructions.
- If you disconnect the recorder's mains lead, you will not be able to view the signals from the connected set top box receiver.

➡continued

A: Connecting a set top box receiver using an aerial cable or an aerial cable and a SCART cord

With this hookup, you can record any programme position on the set top box receiver.

To watch cable programmes, you need to match the programme position on the recorder to the aerial output programme position on the cable box.

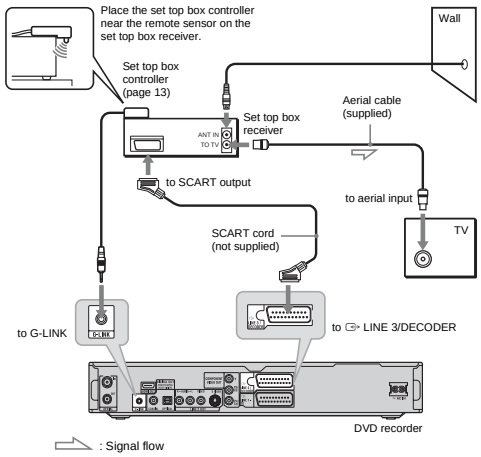


* Connect only if your set top box receiver has a SCART connection.

B: Connecting a set top box receiver using a SCART cord only

With this hookup, you can record any programme position on the set top box receiver. Be sure that the set top box receiver is turned on.

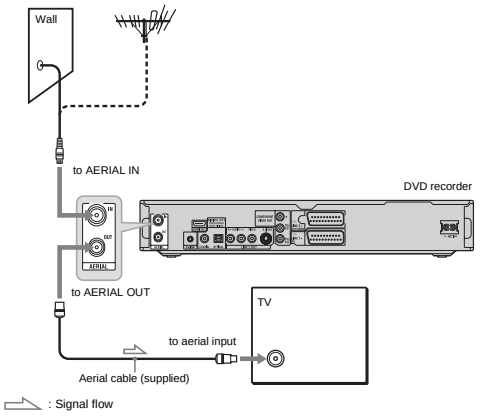
To watch cable or satellite programmes, you need to match the programme position on the recorder to the input jack connected to the set top box receiver (☞ LINE 3/DECODER).



➡continued

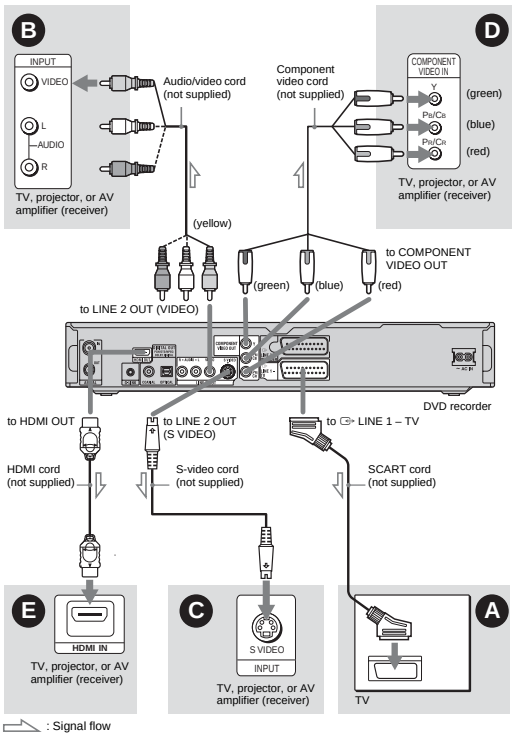
C: Connecting the aerial cable only (no set top box receiver)

Use this hookup if you watch cable programme position without a cable box. Also use this hookup if you are connecting just an aerial antenna.
With this hookup, you can record any programme position by selecting the programme position on the recorder.



Step 2: Connecting the Video Cords/HDMI Cord

Select one of the following patterns, Ⓐ through Ⓔ, according to the input jack on your TV monitor, projector, or AV amplifier (receiver). This will enable you to view pictures.



→continued

Ⓐ SCART input jack
When you set “Easy Setup - Line1 Output” to “S Video” or “RGB” (page 25), use a SCART cord that conforms to the selected signal.

Ⓑ Video input jack
You will enjoy standard quality images.

Ⓒ S VIDEO input jack
You will enjoy high quality images.

Ⓓ Component video input jacks (Y, PB/CB, PR/CR)
You will enjoy accurate colour reproduction and high quality images.
If your TV accepts progressive 525p/625p format signals, use this connection and set “Component Out” in the “Video” setup to “On” (page 102). Then set “Progressive Output” to “On” in the “Video” setup to send progressive video signals. For details, see “Progressive Output” on page 102.

Ⓔ HDMI input jack
Use a certified HDMI cord (not supplied) to enjoy high quality digital picture and sound through the HDMI OUT jack.

When playing “wide screen” images
Some recorded images may not fit your TV screen. To change the picture size, see page 101.

If you are connecting to a VCR
Connect your VCR to the LINE 3/ DECODER jack on the recorder (page 28).

Notes
- Do not connect more than one type of video cord between the recorder and your TV at the same time.
- When you connect the recorder to your TV via the SCART jacks, the TV’s input source is set to the recorder automatically when you start playback. If necessary, press TV ⏎ to return the input to the TV.
- For correct SMARTLINK connection, you will need a SCART cord that has the full 21 pins. Refer to your TV’s instruction manual as well for this connection.
- If you connect this recorder to a TV with SMARTLINK, set “Easy Setup - Line1 Output” to “Video.”
- You cannot connect the HDMI OUT jack (connection Ⓔ) to DVI jacks that are not HDCP compliant (e.g., DVI jacks on PC displays).

* This DVD recorder incorporates High-Definition Multimedia Interface (HDMI™) technology.

HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC.

About the SMARTLINK features (for SCART connections only)

If the connected TV (or other connected equipment such as a set top box) complies with SMARTLINK, NexTView Link*3, MEGALOGIC*1, EASYLINK*2, CINEMALINK*2, Q-Link*3, EURO VIEW LINK*4, or T-V LINK*5, you can enjoy the following SMARTLINK features.

For recording
- TV Direct Rec.
  You can easily record what you are watching on your TV (page 34).
- One Touch EPG
  You can turn on the recorder and TV, set the TV to the recorder’s programme position, and display the GUIDE Plus+ system “Home Screen” with one touch of the TV GUIDE button.

For playback
- One Touch Play
  You can turn on the recorder and TV, set the TV’s input to the recorder, and start playback with one touch of the ▷ (play) button (page 67).
- One Touch Menu
  You can turn on the recorder and TV, set the TV to the recorder’s programme position, and display the Title List menu with one touch of the TITLE LIST button (page 67).

For settings
- Preset Download
  You can download the tuner preset data from your TV to this recorder, and tune the recorder according to that data in “Easy Setup.” This greatly simplifies the “Easy Setup” procedure.
- Automatic Power Off
  The recorder will turn off automatically if the recorder is not used after you turn off the TV.
- NexTView Download
  You can easily set the timer by using the NexTView Download function on your TV. See your TV’s instruction manual.

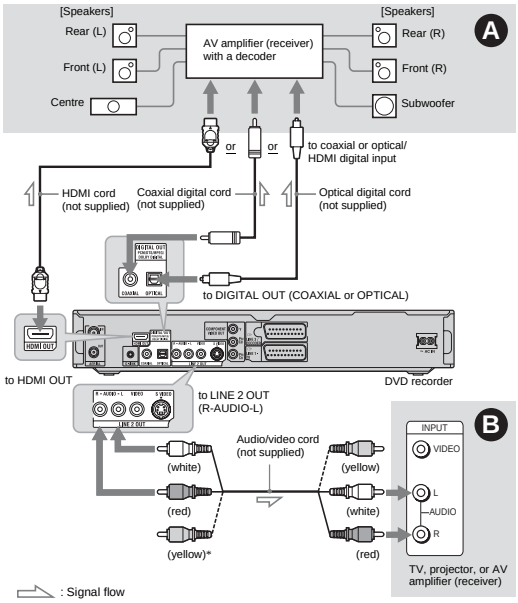
*1 “MEGALOGIC” is a registered trademark of Grundig Corporation.
*2 “EASYLINK” and “CINEMALINK” are trademarks of Philips Corporation.
*3 “Q-Link” and “NexTView Link” are trademarks of Panasonic Corporation.
*4 “EURO VIEW LINK” is a trademark of Toshiba Corporation.
*5 “T-V LINK” is a trademark of JVC Corporation.

Hint
SMARTLINK also works with TVs or other equipment having EPG Timer Control, EPG Title Download, and Now Recording functions. For details, refer to the operating instructions supplied with your TV or other equipment.

Notes
- The SMARTLINK features are available only when “Video” is selected in “Line1 Output.”
- The power must be turned on to use all SMARTLINK features except One Touch Play, One Touch Menu and One Touch EPG.
- Not all TVs respond to the functions above.

Step 3: Connecting the Audio Cords

Select one of the following patterns, Ⓐ or Ⓑ, according to the input jack on your TV monitor, projector, or AV amplifier (receiver). This will enable you to listen to sound.



* The yellow plug is used for video signals (page 17).

Ⓐ Digital audio input jack
If your AV amplifier (receiver) has a Dolby*1 Digital, DTS*2, or MPEG audio decoder and a digital input jack, use this connection. You can enjoy Dolby Digital (5.1ch), DTS (5.1ch), and MPEG audio (5.1ch) surround effects.

Ⓑ Audio L/R (left/right) input jacks
This connection will use your TV's or stereo amplifier's (receiver's) two speakers for sound.

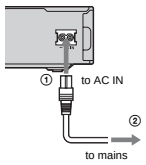
Hint
For correct speaker location, see the operating instructions supplied with the connected components.

Notes
- Do not connect your TV's audio output jacks to the LINE IN (R-AUDIO-L) jacks at the same time. This will cause unwanted noise to come from your TV's speakers.
- With connection Ⓑ, do not connect the LINE IN (R-AUDIO-L) and LINE 2 OUT (R-AUDIO-L) jacks to your TV's audio output jacks at the same time. This will cause unwanted noise to come from your TV's speakers.
- With connection Ⓐ, after you have completed the connection, make the appropriate settings under "Easy Setup - Audio Connection" (page 25). Otherwise, no sound or a loud noise will come from your speakers.
- When you connect the recorder to an AV amplifier (receiver) using an HDMI cord, you will need to do one of the following:
  – Connect the AV amplifier (receiver) to the TV with the HDMI cord.
  – Connect the recorder to the TV with a video cord other than HDMI cord (component video cord, S VIDEO cord, or audio/video cord).

*1 Manufactured under license from Dolby Laboratories.
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories.
*2 "DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.

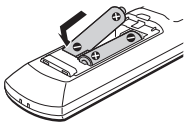
Step 4: Connecting the Mains Lead

Connect the supplied mains lead to the AC IN terminal of the recorder. Then plug the recorder and TV mains leads (power cords) into the mains. After you connect the mains lead, **you must wait for a short while before operating the recorder.** You can operate the recorder once the front panel display lights up and the recorder enters standby mode.
If you connect additional equipment to this recorder (page 28), be sure to connect the mains lead after all connections are complete.



Step 5: Preparing the Remote

You can control the recorder using the supplied remote. Insert two R6 (size AA) batteries by matching the ⊕ and ⊖ ends on the batteries to the markings inside the battery compartment. When using the remote, point it at the remote sensor ▣ on the recorder.

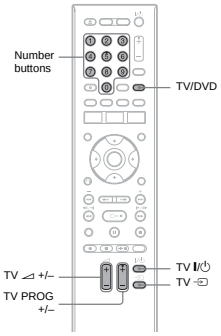


Notes
- If the supplied remote interferes your other Sony DVD recorder or player, change the command mode number for this recorder (page 23).
- Use the batteries correctly to avoid possible leakage and corrosion. Should leakage occur, do not touch the liquid with bare hands. Observe the following:
  – Do not use a new battery with an old battery, or batteries of different manufacturers.
  – Do not attempt to recharge the batteries.
  – If you do not intend to use the remote for an extended period of time, remove the batteries.
  – If battery leakage occurs, wipe out any liquid inside the battery compartment, and insert new batteries.
- Do not expose the remote sensor (marked ▣ on the front panel) to strong light, such as direct sunlight or a lighting apparatus. The recorder may not respond to the remote.
- When you replace the batteries of the remote, the code number and Command Mode may be reset to the default setting. Set the appropriate code number and Command Mode again.

Controlling TVs with the remote

You can adjust the remote's signal to control your TV.

Notes
- Depending on the connected unit, you may not be able to control your TV with some or all of the buttons below.
- If you enter a new code number, the code number previously entered will be erased.



1 Hold down the TV I/⏻ button located at the bottom of the remote.
Do not press the I/⏻ button at the top of the remote.

2 With the TV I/⏻ button pressed down, enter the TV's manufacturer code using the number buttons.
For instance, to enter "09," press "0" then "9." After you enter the last number, release the TV I/⏻ button.

Code numbers of controllable TVs
If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony	01 (default)
Hitachi	24
JVC	33
Panasonic	17, 49
Philips	06, 08
Samsung	71
Sanyo	25
Thomson	43
Toshiba	38

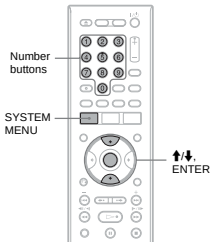
The remote performs the following:

Buttons	Operations
TV I/⏻	Turns your TV on or off
TV (volume) +/–	Adjusts the volume of your TV
TV PROG +/–	Selects the programme position on your TV
TV	Switches your TV's input source

To operate the TV/DVD button (for SCART connections only)
The TV/DVD button switches between the recorder and the last input source selected on the TV. Point your remote at the recorder when using this button.
When you connect the recorder to the TV via the SCART jacks, the input source for the TV is set to the recorder automatically when you start playback. To watch another source, press the TV/DVD button to switch the TV's input source.

If you have a Sony DVD player or more than one Sony DVD recorder

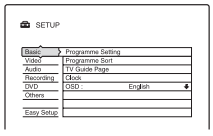
If the supplied remote interferes with your other Sony DVD recorder or player, set the command mode number for this recorder and the supplied remote to one that differs from the other Sony DVD recorder or player after you have completed "Step 6: Easy Setup." The default command mode setting for this recorder and the supplied remote is DVD3.



1 Check that "Easy Setup" (page 25) has been finished. If "Easy Setup" has not been finished, first perform "Easy Setup."

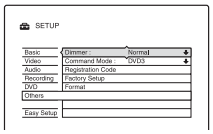
2 Press SYSTEM MENU.
The System Menu appears.

3 Select "SETUP," and press ENTER.

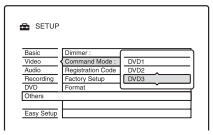


➡continued

4 **Select “Others,” and press ENTER.**



5 **Select “Command Mode,” and press ENTER.**



6 **Select a Command Mode (DVD1, DVD2, or DVD3), and press ENTER.**

7 **Set the Command Mode for the remote so it matches the Command Mode for the recorder you set above.**

Follow the steps below to set the Command Mode on the remote.

① Hold down ENTER.
② While holding down ENTER, enter the Command Mode code number using the number buttons.

Command Mode	Code number
DVD1	number button 1
DVD2	number button 2
DVD3	number button 3

③ Hold down both the number and ENTER buttons at the same time for more than three seconds.

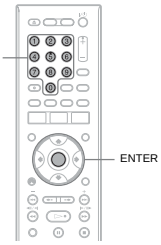
To check the Command Mode for the recorder

Press ■ on the recorder when the recorder is turned off. The Command Mode for the recorder appears in the front panel display.

If the Command Mode for the recorder has not been changed, set the Command Mode for the remote to the default setting of DVD3. If the Command Mode for the remote is changed to DVD1 or DVD2, you will be unable to operate this recorder.

Changing programme positions of the recorder using the remote

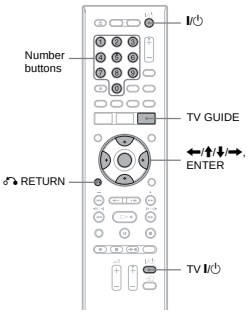
You can change programme positions of the recorder using the number buttons.



Example: for channel 50
Press “5,” “0,” then press ENTER.

Step 6: Easy Setup

Make the basic adjustments by following the on-screen instructions in “Easy Setup.” Be careful not to disconnect the cables or exit the “Easy Setup” function during this procedure.



1 **Turn on the recorder and your TV. Then switch the input selector on your TV so that the signal from the recorder appears on your TV screen.**

The initial settings message appears.
• If this message does not appear, select “Easy Setup” from “SETUP” in the System Menu (page 111).

2 **Press ENTER.**

Follow the on-screen instructions to make the following settings.

◆**Easy Setup - OSD**
Select a language for the on-screen displays.

◆**Easy Setup - Tuner System**
Select your country/region or language. The programme position order will be set according to the country/region you set. To set the programme positions manually, see page 96.
• If you live in a French speaking country that is not listed on the display, select “ELSE - English.”

◆**Easy Setup - Postal Code**
Enter your postal code using the number buttons or ←/↑/↓/→, and press ENTER.
To erase a number, move the cursor to the number, and press RETURN.
Note that the option for entering your Postal Code only appears if you select one of the following tuner systems in the step above:
UK, B, NL, D, E, I, CH, A.

◆**Easy Setup - Clock**
The recorder will automatically search for a clock signal. If a clock signal cannot be found, set the clock manually using ←/↑/↓/→, and press ENTER.

◆**Easy Setup - TV Type (page 101)**
If you have a wide-screen TV, select “16:9.” If you have a standard TV, select either “4:3 Letter Box” (shrink to fit) or “4:3 Pan Scan” (stretch to fit). This will determine how “wide-screen” images are displayed on your TV.

◆**Easy Setup - Component Out**
If you are using the COMPONENT VIDEO OUT jack, select “On.”

◆**Easy Setup - Line3 Input**
If you plan to connect a decoder such as a PAY-TV/Canal Plus analogue decoder to the LINE 3/DECODER jack, select “Yes.”

→continued

◆**Easy Setup - Line1 Output**
To output video signals, select “Video.” To output S video signals, select “S Video.”
To output RGB signals, select “RGB.” Select “Video” to enjoy the SMARTLINK features (page 18).
• If you set “Easy Setup - Component Out” to “On,” you cannot select “RGB.”
• If you set “Easy Setup - Line3 Input” to “Yes,” you cannot select “S Video.”

◆**Easy Setup - Audio Connection**
If you connected an AV amplifier (receiver) using either a digital optical or coaxial cord, select “Yes : DIGITAL OUT” and set the digital output signal (page 104).

3 **Press ENTER when “Finish” appears.**

“Easy Setup” is finished.

To receive Guide Plus+ system data your recorder must be turned off when not in use. If your recorder is connected to a set top box receiver, be sure to leave the set top box receiver turned on. After initial setup, it may take up to 24 hours to begin receiving TV programme listings.

To return to the previous step

Press RETURN.

Hints
• If your AV amplifier (receiver) has an MPEG audio decoder, set “MPEG” to “MPEG” (page 104).
• If you want to run “Easy Setup” again, select “Easy Setup” from “SETUP” in the System Menu (page 111).

Setting up your set top box receiver for the GUIDE Plus+® system

Follow the steps below to set up your set top box receiver for the GUIDE Plus+ system. Note that the OSD language, Clock, Country and Postal Code are all set for the GUIDE Plus+ system when Easy Setup is completed.

1 **Press TV GUIDE.**

The GUIDE Plus+ system “Home Screen” appears.

2 **Select “Setup” in the Menu Bar using ↑/→, and press ENTER.**

The GUIDE Plus+ setup menu appears.

3 **Select “Basic Setup” using ↑/↓, and press ENTER.**

4 **Select “External Receiver 1,” and press ENTER.**

You can also select “External Receiver 2” or “External Receiver 3” if you have connected additional set top box receivers.

5 **Press ENTER to select “Continue.”**

6 **Select the set top box receiver type using ↑/↓, and press ENTER.**

7 **Select the provider using ↑/↓, and press ENTER.**

8 **Select the receiver brand using ↑/↓, and press ENTER.**

If you select “Other providers,” you can select a receiver brand from a list of all available brands.
If your receiver brand is not on the list, select “???.”
The receiver brand list is automatically updated, so your receiver may be available at a later date. Select your brand when it becomes available. Until then, use “???.”

9 **Select the connection you used for your set top box receiver using ↑/↓, and press ENTER.**

When the set top box receiver is connected to the recorder using hookup A or C, select “Antenna.” When the set top box receiver is connected to the recorder using hookup B, select “Line3.” The display asks for confirmation.

10 **Press ENTER to select “Continue.”**

The Video Window switches to the specified programme position.

11 **Select “YES” using ↑/↓, and press ENTER.**

The display asks for confirmation.
If the Video Window does not switch to the specified programme position, select “NO” and press ENTER until the Video Window switches to the specified programme position.

If you cannot get the recorder to control your set top box receiver

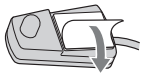
Check the connection and position of the set top box controller (page 14).
If your set top box receiver still does not operate with this recorder, refer to the instructions supplied with your set top box receiver and contact your cable or satellite company to see if they can provide you with a compatible set top box receiver.

Notes
• The list of external receivers controllable by the GUIDE Plus+ system is updated constantly and is distributed through GUIDE Plus+ system data signals. Since the time your recorder has been produced and the time you installed your recorder for the first time, new external receiver codes might have been added.
• If the external receiver is still not on the list or is not controlled properly by the recorder, please call Customer Support to report the brand and model of your external receiver.

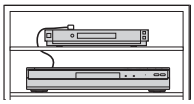
To fix the set top box controller to your set top box receiver

Once you have confirmed that the set top box controller controls your set top box receiver, fix it in place.

1 Remove the backing on the double-sided tape.



2 Attach it so that the set top box controller is directly above the remote control sensor on your set top box receiver.

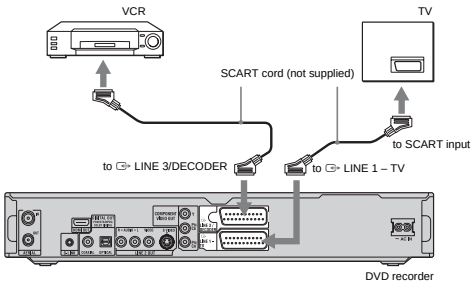


Connecting a VCR or Similar Device

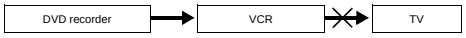
After disconnecting the recorder's mains lead from the mains, connect a VCR or similar recording device to the LINE IN jacks of this recorder.
Use the DV IN jack on the front panel if the equipment has a DV output jack (i.LINK jack) (page 91).
For details, refer to the instruction manual supplied with the connected equipment.
To record on this recorder, see "Recording from connected equipment without a timer" on page 65.

Connecting to the LINE 3/DECODER jack

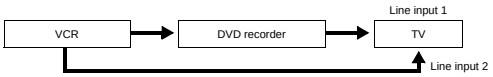
Connect a VCR or similar recording device to the LINE 3/DECODER jack of this recorder.



Notes
- Pictures containing copy protection signals that prohibit any copying cannot be recorded.
- If you pass the recorder signals through a VCR, you may not receive a clear image on your TV screen.



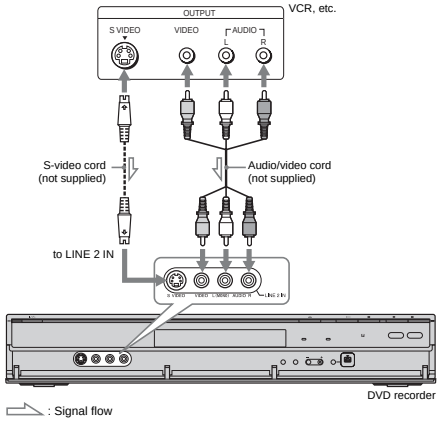
Be sure to connect your VCR to the DVD recorder and to your TV in the order shown below. To watch video tapes, watch the tapes through a second line input on your TV.



- The SMARTLINK features are not available for devices connected via the DVD recorder's LINE 3/DECODER jack.
- When you record to a VCR from this DVD recorder, do not switch the input source to TV by pressing the TV/DVD button on the remote.
- If you disconnect the recorder's mains lead, you will not be able to view the signals from the connected VCR.

Connecting to the LINE 2 IN jacks on the front panel

Connect a VCR or similar recording device to the LINE 2 IN jacks of this recorder. If the equipment has an S-video jack, you can use an S-video cord instead of an audio/video cord.



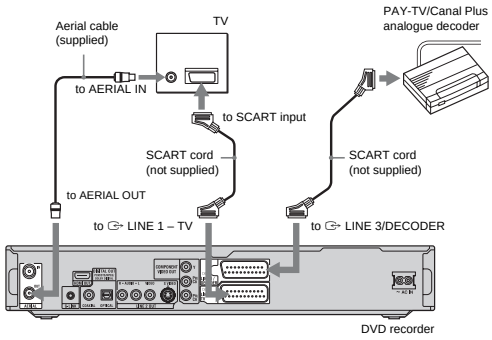
Hint
When the connected equipment outputs only monaural sound, connect to just the L(MONO) and VIDEO input jacks on the front of the recorder. Do not connect the R input jack.

Notes
- Do not connect the yellow LINE IN (VIDEO) jack when using an S-video cord.
- Do not connect the output jack of this recorder to another equipment's input jack with the other equipment's output jack connected to the input jack of this recorder. This may cause noise (feedback).
- Do not connect more than one type of video cord between the recorder and your TV at the same time.

Connecting a PAY-TV/Canal Plus Analogue Decoder

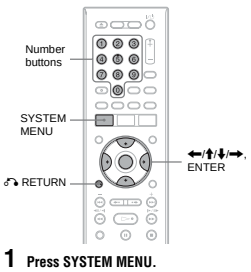
You can watch or record PAY-TV/Canal Plus analogue decoder programmes if you connect a decoder (not supplied) to the recorder. Disconnect the recorder's mains lead from the mains when connecting the decoder. Note that when you set "Line3 Input" to "Decoder" in step 5 of "Setting PAY-TV/Canal Plus analogue programme positions" (page 31), you will not be able to select "L3" because Line 3 will become a dedicated line for the decoder.

Connecting a decoder



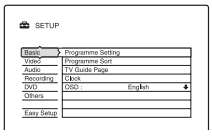
Setting PAY-TV/Canal Plus analogue programme positions

To watch or record PAY-TV/Canal Plus analogue programmes, set your recorder to receive the programme positions using the on-screen display.
In order to set the programme positions correctly, be sure to follow all of the steps below.

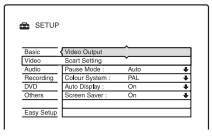


1 Press SYSTEM MENU.
The System Menu appears.

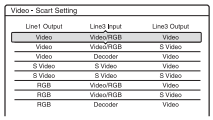
2 Select "SETUP," and press ENTER.



3 Select "Video," and press ENTER.



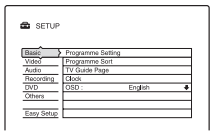
4 Select "Scart Setting," and press ENTER.



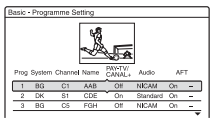
5 Press ↑/↓ to select "Video" or "RGB" for "Line1 Output," "Decoder" for "Line3 Input," and "Video" for "Line3 Output," and press ENTER.
The "Video" setup display appears again.

6 Press ↩ RETURN to return the cursor to the left column.

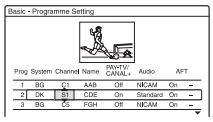
7 Select "Basic," and press ENTER.



8 Select "Programme Setting," and press ENTER.

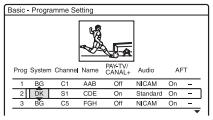


9 Press ↑/↓ to select the desired programme position, and press ENTER.



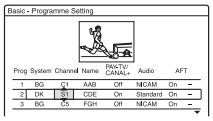
➡continued

10 Select “System” using ←/→.


Basic - Programme Setting
Prog System Channel Name PAY-TV/ CANAL+ Audio AFT
1 BG C1 AAB Off NICAM On –
2 DK S1 CDE On Standard On –
3 BG C5 FGH Off NICAM On –

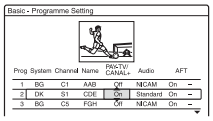
11 Press ↑/↓ to select an available TV system, BG, DK, I, or L.
To receive broadcasts in France, select “L.”

12 Select “Channel” using ←/→.


Basic - Programme Setting
Prog System Channel Name PAY-TV/ CANAL+ Audio AFT
1 BG C1 AAB Off NICAM On –
2 DK S1 CDE On Standard On –
3 BG C5 FGH Off NICAM On –

13 Select the PAY-TV/Canal Plus analogue programme position using ↑/↓ or number buttons.

14 Select “PAY-TV/CANAL+” using ←/→.


Basic - Programme Setting
Prog System Channel Name PAY-TV/ CANAL+ Audio AFT
1 BG C1 AAB Off NICAM On –
2 DK S1 CDE On Standard On –
3 BG C5 FGH Off NICAM On –

15 Select “On” using ↑/↓, and press ENTER.

To return to the previous step
Press ↶ RETURN.

Note
If you disconnect the recorder’s mains lead, you will not be able to view the signals from the connected decoder.

4 Press ● REC.
Recording starts.
Recording stops automatically after 8 hours of continuous recording or when the HDD or DVD is full.

To stop recording
Press ■ REC STOP.
Note that it may take a few seconds for recorder to stop recording.

To record the entire programme (Programme Rec)
Press OPTIONS to select “Rec. Programme.” The current programme that you are watching will be recorded. Recording automatically stops when the programme ends.

To watch another TV programme while recording
If your TV is connected to the ⇨ LINE 1 – TV jack, set your TV to the TV input using the TV/DVD button and select the programme you want to watch. If your TV is connected to the LINE 2 OUT or COMPONENT VIDEO OUT jacks, set the TV to TV input using the TV ⇦ button (page 22).

TV Direct Rec.
If you are using the SMARTLINK connection and the “TV Direct Rec.” is set to “On” (page 107), you can easily record what you are watching on your TV.
When the TV and the recorder are turned on, press ● REC. The recorder starts recording what you are watching on your TV.

Note
If “TV” appears in the front panel display, you cannot turn off the TV or change the programme position during TV Direct Rec. To turn off the function, set “TV Direct Rec.” to “Off” in the “Recording” setup (page 107).

About the Teletext function
Some broadcast systems ensure a Teletext service* in which the complete programmes and their data (title, date, programme position, recording start time etc.) are stored day by day. When recording a programme, the recorder automatically takes the programme name from the Teletext pages and stores it as the title name. For details, see “Auto Programme Title Labelling (TV Guide Page)” on page 99.
Note that the Teletext information will not appear on your TV screen. To view the Teletext information on your TV screen, press TV/DVD on the remote to switch the input source to your TV (page 22).
* not available in some areas

Notes
- After pressing ● REC, it may take a short while to start recording.
- You cannot change the recording mode while recording.
- If there is a power failure, the programme you are recording may be erased.
- You cannot watch a PAY-TV/Canal Plus programme while recording another PAY-TV/ Canal Plus programme.
- To use the TV Direct Rec function, you must first correctly set the recorder’s clock.

Checking the disc status while recording

You can check the recording information such as recording time or disc type.

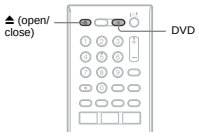
Press DISPLAY during recording.
The recording information appears.

1 Disc type/format
2 Recording status
3 Recording mode
4 Recording time

Press DISPLAY to turn off the display.

1. Inserting a Disc

+RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD CD DATA DVD DATA CD



1 Press DVD.

2 Press ⏏ (open/close), and place a disc on the disc tray.

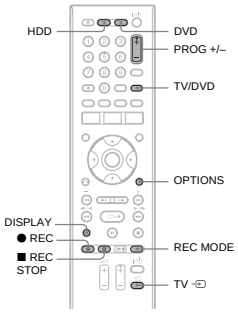
3 Press ⏏ (open/close) to close the disc tray.
Wait until “LOAD” disappears from the front panel display.
Unused DVDs are formatted automatically.
- For DVD-RW discs
  DVD-RWs are formatted in the recording format (VR mode or Video mode) set by “Format DVD-RW” in the “DVD” setup.
- For DVD-R discs
  DVD-Rs are automatically formatted in Video mode. To format an unused DVD-R in VR mode, format the disc using the “Disc Information” display (page 43) **before** you make a recording.

If the disc is recordable on this recorder, you can manually re-format the disc to make a blank disc (page 43).

2. Recording a Programme

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

This section introduces the basic operation to record a current TV programme to the hard disk (HDD) or to a disc (DVD). For an explanation of how to make timer recordings, see page 54.



1 Press HDD or DVD.
If you want to record to a DVD, insert a recordable DVD.

2 Press PROG +/– to select the programme position or input source you want to record.

3 Press REC MODE repeatedly to select the recording mode.
Each time you press the button, the display on the TV screen changes as follows:

HQ → HSP → SP → LSP → SLP ← EP ← LP ← ESP

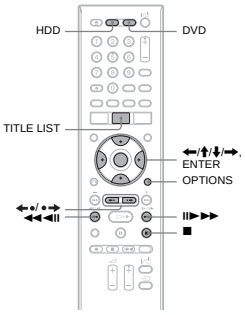
For more details about the recording mode, see page 54.

→continued

3. Playing the Recorded Programme (Title List)

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

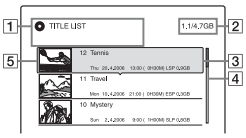
To play a recorded title, select the title from the Title List.



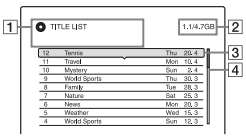
1 Press HDD or DVD.
If you select DVD, insert a DVD (see “1. Inserting a Disc” on page 33).
Playback starts automatically depending on the disc.

2 Press TITLE LIST.
To show the extended Title List, press OPTIONS to select “Display List,” and press ENTER.

Title List with Thumbnail Images (Example: DVD+RW)



Extended Title List



1 Disc type:
Displays the media type, HDD or DVD. Also displays the title type (Original or Playlist) for HDD or DVD-RW/DVD-R (VR mode) disc titles.

2 Disc space (remainder/total)

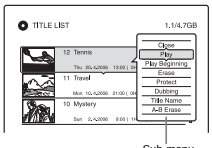
3 Title information:
Displays the title number, title name, and recording date. Title size is shown in the Thumbnail title list.
● (red): Indicates that the title is currently being recorded.
◐◑: Indicates that the title is currently being dubbed.
🔒: Indicates the protected title.
“NEW”: Indicates that the title is newly recorded (not played back) (HDD only).
COPY ONCE: Indicates titles containing “Copy-Once” copy protection signals (HDD only) (page 87).

4 Scroll bar:
Appears when all of the titles do not fit on the list. To view the hidden titles, press ↑/↓.

5 Title’s thumbnail picture:
The still images for each title are displayed.

→continued

3 Select a title, and press ENTER.
The sub-menu appears.
The sub-menu displays options applicable only to the selected item. The displayed options differ depending upon the model, situation, and disc type.



Sub-menu

4 Select "Play," and press ENTER.
Playback starts from the selected title.

To stop playback
Press ■ (stop).

To scroll the list display by page (Page mode)
Press ←•/•→ while the list display is turned on. Each time you press ←•/•→, the entire Title List changes to the next/previous page of titles.

About the Title List for HDD/DVD-RWs/DVD-Rs (VR mode)
You can switch the Title List to show Original or Playlist titles.
While the Title List menu is turned on, press ←/→.

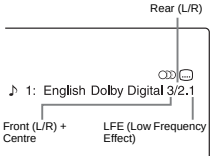
To change the title order (Sort)
While the Title List menu is turned on, press OPTIONS to select "Sort Titles." Press ↑/↓ to select the item, and press ENTER.

Order	Sorted
By Date	In order of when the titles were recorded. The title that is recorded most recently is listed at the top.
By Title	In alphabetical order.
By Number	In order of recorded title number.
Unseen Title (HDD only)	In order of when the titles were recorded. The title that is recorded most recently and has not been played is listed at the top. Playlist titles are not displayed.

To change a title thumbnail picture (Thumbnail) (HDD/DVD-RW/DVD-R in VR mode only)
You can select a favourite scene for the thumbnail picture shown in the Title List menu.

1 Press TITLE LIST.
Press ←/→ to switch the Title Lists, if necessary.
2 Select a title, and press ENTER.
The sub-menu appears.
3 Select "Set Thumbnail," and press ENTER.
The display for setting the thumbnail point appears and the title starts to play.
4 While watching the playback picture, press ◀◀/▶▶ to select the scene you want to set for a thumbnail picture, and press ENTER.
Playback pauses.
5 Press ENTER if the scene is correct.
If the scene is incorrect, press ◀II/II▶ to select the scene you want to set for a thumbnail picture, and press ENTER.
The display asks for confirmation.
• To change the thumbnail, press ↑.
6 Select "OK," and press ENTER.
The scene is set for the title's thumbnail picture.

2 Available functions for DVD VIDEOs (angle/audio/subtitle, etc.), or playback data for DATA DVDs and DATA CDs
3 The current selected function or audio setting (appears only temporarily)
Example: Dolby Digital 5.1 ch



4 The current selected angle
5 Disc type*1/format (page 8)
6 Title type (only appears for Playlists)
7 Play mode
8 Recording mode (page 54)
9 Playing status bar*2
10 Title number (page 72)
(Shows either track number, scene number, or file name number for CDs, VIDEO CDs, DATA DVDs, or DATA CDs.)
11 Album name appears for DATA DVDs or DATA CDs.
12 Playing time

*1 Displays Super VIDEO CDs as "SVCD," DATA CDs as "CD" and DATA DVDs as "DVD."
*2 Does not appear with VIDEO CDs, DATA DVDs, and DATA CDs.

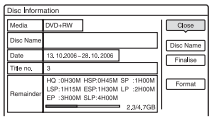
Hints
• If "DTS" of "Audio Connection" is set to "Off" in the "Audio" setup, the DTS track selection option will not appear on the screen even if the disc contains DTS tracks (page 104).
• When "Auto Display" is set to "On" (default) in the "Video" setup (page 103), information automatically appears on the screen when the recorder is operated.

Note
Playing time of MP3 audio tracks may not be displayed correctly.

Checking the remaining disc space

You can check the remaining disc space using the "Disc Information" display.

1 Insert a disc.
See "1. Inserting a Disc" on page 33.
2 Press OPTIONS to select "Disc Information," and press ENTER.
The "Disc Information" display appears.
Available settings differ depending on the disc type.
Example: When a DVD+RW is inserted.



"Remainder" (approximate)
• The remaining recording time in each of the recording modes
• Disc space bar
• Remaining disc space/total disc space

Hint
To increase disc space, see "To open up disc space" (page 78).

To turn off the Title List
Press TITLE LIST.

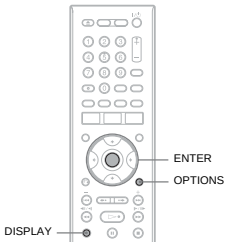
Hints
• After recording, the first scene of the recording (the title) is automatically set as the thumbnail picture.
• You can select "TITLE LIST" from the System Menu.

Notes
• The title names may not appear for DVDs created on other DVD recorders.
• It may take a few seconds for the thumbnail pictures to be displayed.
• After editing, the title thumbnail picture may change to the first scene of the recording (title).
• After dubbing, the title thumbnail picture set on the source recording is cancelled.

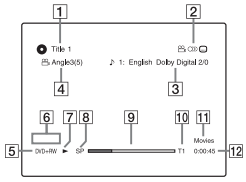
4. Displaying the Playing Time and Play Information

HDD +RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD CD DATA DVD DATA CD

You can check the playing time of the current title, chapter, track, or disc. Also, you can check the disc name recorded on the DVD/CD.



Press DISPLAY.
The displays differ depending on the disc type or playing status.

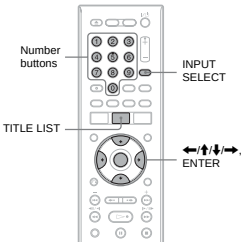


1 Title number/name
(Shows either track number, track name, scene number, or file name for CDs, VIDEO CDs, DATA DVDs, or DATA CDs.)

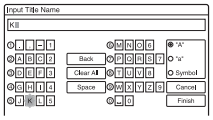
5. Changing the Name of a Recorded Programme

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

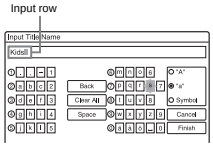
You can label a DVD, title, or programme by entering characters. You can enter up to 64 characters for a title or disc name, but the actual number of characters displayed in the menus such as the Title List will vary. The steps below explain how to change the name of the recorded programme.



1 Press TITLE LIST.
2 Select a title, and press ENTER.
The sub-menu appears.
3 Select "Title Name," and press ENTER.
The display for entering characters appears.
4 Press ←/↑/↓/→ to move the cursor to the right of the display and select "A" (upper-case), "a" (lower-case), or "Symbol," and press ENTER.
The characters for the selected type are displayed.
5 Press ←/↑/↓/→ to select the character you want to enter, and press ENTER.
The selected character appears at the top of the display.
Example: Input Title Name



The type of characters will change according to the language you select in "Easy Setup." Some languages allow you to enter an accent mark.
To enter a letter with an accent mark, select an accent followed by the letter. Example: Select " ` " and then "a" to enter "à."
To insert a space, select "Space."
6 Repeat steps 4 and 5 to enter the remaining characters.



To erase a character, move the cursor to the right of the character at the input row. Select "Back" and press ENTER.
To insert a character, move the cursor to the right of the point where you want to insert the character. Select the character and press ENTER.
To erase all of the characters, select "Clear All" and press ENTER.
7 Select "Finish," and press ENTER.
To cancel the setting, select "Cancel."

To use the number buttons

You can also use the number buttons to enter characters. Refer to the number next to each row of letters on your TV screen.

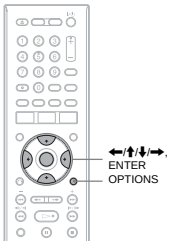
1. In step 5 above, press a number button repeatedly to select a character.
   Example:
   Press the number 3 button once to enter "D."
   Press the number 3 button three times to enter "F."
2. Press ENTER and select the next character.
3. Select "Finish" and press ENTER.

Hint

You can switch between "A" (upper-case), "a" (lower-case), or "Symbol" by pressing INPUT SELECT.

6. Labelling and Protecting a Disc

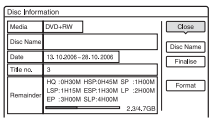
You can execute options effective for the entire disc using the "Disc Information" display.



Labelling a disc

+RW -RWVR -RWVideo +R -RVR -RVideo

1. **Insert a disc.**
   See "1. Inserting a Disc" on page 33.
2. **Press OPTIONS to select "Disc Information," and press ENTER.**
   The "Disc Information" display appears.
   Available settings differ depending on the disc type.
   Example: When the inserted disc is a DVD+RW.



3. **Select "Disc Name," and press ENTER.**
   Enter the disc name in the "Input Disc Name" display (page 39).

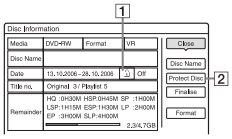
Note

You can enter up to 64 characters for a DVD's disc name. The disc name may not appear when the disc is played on other DVD equipment.

Protecting a disc

-RWVR -RVR

1. **Insert a disc.**
   See "1. Inserting a Disc" on page 33.
2. **Press OPTIONS to select "Disc Information," and press ENTER.**
   The "Disc Information" display appears.
   Available settings differ depending on the disc type.
   Example: When the inserted disc is a DVD-RW (VR mode).



   1 "On"/"Off": Indicates whether protection is set (DVD-RW/DVD-R in VR mode only)
   2 "Protect Disc"
3. **Select "Protect Disc," and press ENTER.**
4. **Select "Protect," and press ENTER.**

To cancel the protection

Select "Unprotected" in step 4.

Hint

You can set protection for individual titles (page 78).

7. Playing the Disc on Other DVD Equipment (Finalise)

+RW -RWVR -RWVideo +R -RVR -RVideo

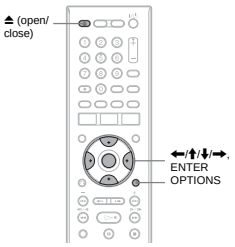
Finalising is necessary when you play discs recorded with this recorder on other DVD equipment.
When you finalise a DVD+RW, DVD-RW (Video mode), DVD+R, or DVD-R (Video mode), a DVD menu will be automatically created, which can be displayed on other DVD equipment.
Before finalising, check the differences between the disc types in the table below.

Differences between the disc types

+RW	Discs are automatically finalised when removed from the recorder. However, you may need to finalise the disc for certain DVD equipment, or if the recording time is short. You can edit or record on the disc even after finalising.
-RWVR	Finalising is unnecessary when playing a disc on VR format compatible equipment. Even if your other DVD equipment is VR format compatible, you may need to finalise the disc, especially if the recording time is short. You can edit or record on the disc even after finalising.
-RWVideo	Finalising is necessary when playing on any equipment other than this recorder. After finalising, you cannot edit or record on the disc. If you want to record on it again, unfinalise (page 43) or reformat the disc (page 43). However, if you reformat the disc, all recorded contents will be erased.
-RVR	Finalising is necessary. The disc can be played only on equipment that supports DVD-R in VR mode. After finalising you cannot edit or record on the disc using this recorder.

→continued

+R -RVideo	Finalising is necessary when playing on any equipment other than this recorder. After finalising, you cannot edit or record on the disc.

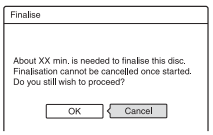


Finalising the disc using ⏏ (open/close) button

1. **Make a recording.**
   See "2. Recording a Programme" on page 33.
2. **Press ⏏ (open/close).**
   The display shows the approximate time required for finalising and asks for confirmation.
   For DVD+RWs, the recorder automatically starts finalising the disc. After finalising, the disc will be ejected automatically.
3. **Select "OK," and press ENTER.**
   The recorder starts finalising the disc. After finalising, the disc will be ejected automatically.

Finalising the disc using "Disc Information" display

1. **Insert a disc.**
   See "1. Inserting a Disc" on page 33.
2. **Press OPTIONS to select "Disc Information," and press ENTER.**
   The "Disc Information" display appears.
3. **Select "Finalise," and press ENTER.**
   The display shows the approximate time required for finalising and asks for confirmation.
   (Example: DVD+RW)


Finalise
About XX min. is needed to finalise this disc.
Finalisation cannot be cancelled once started.
Do you still wish to proceed?
OK
Cancel

4. **Select "OK," and press ENTER.**
   The recorder starts finalising the disc.

Hint

You can check whether the disc has been finalised or not. If you cannot select "Finalise" in step 3 above, the disc has already been finalised.

Notes

- Depending on the condition of the disc, recording, or the DVD equipment, discs may not play even if the discs are finalised.
- The recorder may not be able to finalise the disc if it was recorded on another recorder.

Unfinalising a disc

-RWVR -RWVideo

For DVD-RWs (Video mode)

DVD-RWs (Video mode) that have been finalised to prohibit additional recording or editing can be unfinalised to allow further recording or editing.

For DVD-RWs (VR mode)

If you cannot record or edit on a DVD-RW (VR mode) that has been finalised with other DVD equipment, unfinalise the disc.

Note

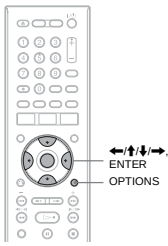
The recorder is not able to unfinalise DVD-RWs (Video mode) that have been finalised on another recorder.

1. **Insert a disc.**
   See "1. Inserting a Disc" on page 33.
2. **Press OPTIONS to select "Disc Information," and press ENTER.**
   The "Disc Information" display appears.
3. **Select "Unfinalise," and press ENTER.**
   The recorder starts unfinalising the disc. Unfinalising may take several minutes.

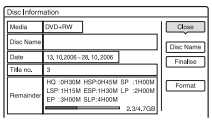
8. Reformatting a disc

+RW -RWVR -RWVideo

New discs are automatically formatted when inserted. If necessary, you can manually re-format a DVD+RW or DVD-RW disc to make a blank disc. For DVD-RWs, you can select a recording format (VR mode or Video mode) according to your needs (page 77).



1. **Insert a disc.**
   See "1. Inserting a Disc" on page 33.
2. **Press OPTIONS to select "Disc Information," and press ENTER.**
   Example: When a DVD+RW is inserted.



3. **Select "Format," and press ENTER.**
4. **Select "OK," and press ENTER.**
   For DVD-RWs and unrecorded DVD-Rs (Video mode), select "VR" or "Video," and press ENTER.
   All contents on the disc are erased.

→continued

Hint

By reformatting, you can change the recording format on DVD-RWs, or record again on DVD-RWs that have been finalised.

Note

On this model, 1 GB (read "gigabyte") is equivalent to 1 billion bytes. The larger the number, the larger the disc space.

"Info": Shows information when available.
"Editor": Allows you to edit the channel lineup and channel display (page 52).
"Setup": Allows you to change the language, country/region, postal code, input source, or host channel.

5 "Home" position: When you press the blue button ("Home"), the cursor returns to the last programme position on the "Grid."

6 Tiles: Shows the programme titles and category; green (sports), purple (movies), blue (children's), teal (others).

7 Broadcast station Logo: Shows the broadcast station logo.

8 Time Slot: Indicates the currently selected time slot. Use ←/→ to select a different time slot.

Troubleshooting guide

If you are having trouble displaying the television programme list, please check the following:

- Your country/region and postal code must be set correctly (page 25).
- The clock must be set correctly. If the clock is not set, set it manually (page 100).
- This recorder downloads the GUIDE Plus+ data several times a day when the recorder is turned off (standby mode). Turn off the recorder when you are not using it (for example, at night). After initial setup (page 25), it may take up to 24 hours for your recorder to start receiving programme listings. It may take up to one day to receive all seven days of TV programme listings.
- Check the following if the programme guide data has not been received after waiting for a day:
  – "Easy Setup" (page 25) is finished.
  – The host channel is not disabled (see "Disabling programme positions" on page 53).
  – The timer is not set.
  If the programme guide data still cannot be received after checking the above, search for the host channel at the following website and set the host channel manually (page 52):
  www.europe.guideplus.com
- If the host channel has changed or moved, the programme guide data cannot be received. In this case, follow the steps in "Searching for the GUIDE Plus+ host channel" (page 51) to update the host channel setting.
- If you made connection "B: Connecting a set top box receiver using a SCART cord only" (page 15) and did not connect an aerial cable from your set top box receiver to the recorder, do the following:
  – Turn on your set top box receiver.
  – Connect the set top box controller.
  – Follow the steps in "Changing the GUIDE Plus+ host channel manually" (page 52) to set the host channel manually. Be sure to set your set top box receiver (tuner) as the source.

Notes

- Your set top box receiver's programme position may suddenly change even if the recorder is turned off. This is because the set top box controller has changed the programme position to receive the GUIDE Plus+ data.
- When you set "Factory Setup" to "All," the recorder is initialized. When you change the following settings, the GUIDE Plus+ system is reset:
  – Country/region setting in "Easy Setup"
  – "Country" of "Setup" - "Basic Setup" in the Menu Bar
  – Postal code setting in "Easy Setup"
  – "Postal Code" of "Setup" - "Basic Setup" in the Menu Bar
  Note that the GUIDE Plus+ system is also reset when you make changes to the host channel settings or if you set "Factory Setup" to "Basic."

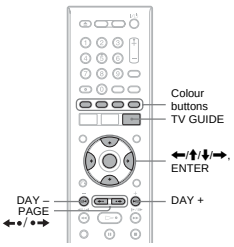
GUIDE Plus+

Introduction to the GUIDE Plus+ System

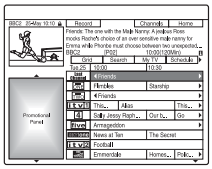
The GUIDE Plus+® system is a free interactive programme guide. It displays up to seven days of programme listings, including programme titles, promotions, and broadcast information. GUIDE Plus+ data for the television programme listings are carried by your local broadcast host channel and are received through your aerial, set top box receiver, or direct cable connection from the wall.
Visit www.europe.guideplus.com for a list of all European host channels.

These are just a few of the ways to use the GUIDE Plus+ system.
– Search for a programme by listing them according to category (such as Movies or Sports) or by using the Keyword Search function (page 49).
– Once you have found the programme you are looking for, use the GUIDE Plus+ system to set the timer for recording (page 56).
– You can set the system to display your favourite programmes according to conditions that you set, such as category and keyword (page 49).
For more information, see "Watching TV using the GUIDE Plus+ System" (page 47).

Watching TV using the GUIDE Plus+ System



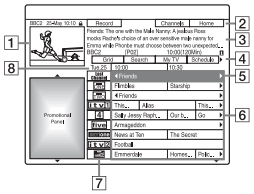
1 Press TV GUIDE.
The GUIDE Plus+ system "Home Screen" appears.



2 Select a programme using ←/↑/↓/→, and press ENTER.
The GUIDE Plus+ system disappears and the programme position changes to the selected programme.

Learning the common elements

Press TV GUIDE.
The GUIDE Plus+ system "Home Screen" appears.



1 Video Window: This shows the programme you were watching when you pressed TV GUIDE.

2 Action Bar: When the same colour button on the remote is pressed, the Action Bar functions. The Action Bar function differs according to the screen.

3 Information Box: Shows information about the selected programme when the "Home Screen" is displayed. Contents will differ according to the displayed screen.

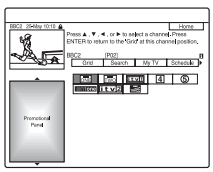
4 Menu Bar: Press the blue button ("Home"), and press ↑ to move the cursor to the Menu Bar. Then, select one of the following features using ←/→, and press ENTER.
"Grid": Shows the programmes for the current time slot and next 7 days.
"Search": Allows you to search for titles by category or by keyword (page 48). The displayed category depends upon the programme data received by this recorder. Movies, Sports, and Children are examples of possible categories.
"My TV": Sets the profile for your favourite programmes (page 49).
"Schedule": Displays the list of timer settings (page 61).

→continued

To select a programme position quickly using the TV broadcast station logo

1 Press TV GUIDE.
The GUIDE Plus+ system "Home Screen" appears.

2 Press the yellow button ("Channels").



3 Select the TV broadcast station logo using ←/↑/↓/→, then press ENTER.
The display returns to "Grid" and the programme currently being broadcast by the selected TV station is selected.

4 Select a programme using ←/→, and press ENTER.

To unlock the Video Window

The Video Window is locked so that it does not change programme positions when you move the cursor across other titles. From "Grid," select the logo of the programme position that is locked, and press the red button ("Unlock"). "🔒" changes to "🔓" and the Video Window is unlocked. To lock the Video Window, select the logo of the programme position you want to lock and press the red button ("Lock").

To return to the "Home" position

Press the blue button ("Home").
The cursor returns to the home position on the "Grid."

To set a programme for timer recording

See "One Button Recording (GUIDE Plus+)" (page 56).

To close the GUIDE Plus+ system

Press TV GUIDE.

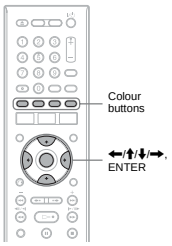
Hints

- Press the PAGE ←•/•→ buttons to change the programme list by page.
- Press the DAY +/– buttons to change the programme list by day.

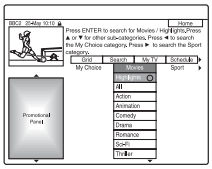
Notes

- The Video Window is locked during recording and the lock indicator appears in the Video Window. You cannot unlock the Video Window while recording.
- If you are watching programmes through a set top box, the Video Window may not change as fast as you move the cursor. In this case, lock the Video Window (page 47).
- The screen saver will appear if no buttons are pressed for more than ten minutes.

Searching for a Programme using the GUIDE Plus+ System



1 Select "Search" in the Menu Bar, and press ENTER.



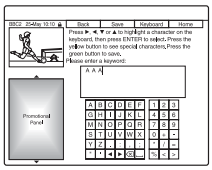
2 Select a category using ←/→, and press ENTER.
To search for a programme by keyword, select "My Choice." You can search for all programmes that contain the keyword in the programme's title and in the programme's Information Box. If no keywords are displayed, enter the keyword. See "To enter a new keyword" below.

3 Select a sub-category using ↑/↓, and press ENTER.
Programmes that meet the conditions are listed up.
The sub-categories differ according to country/region.

4 Select a programme using ↑/↓, and press ENTER.

To enter a new keyword

1 Select "Search" in the Menu Bar, and press ENTER.
2 Select "My Choice" using ←/→.
3 Press the yellow button ("Add").
The display for entering characters appears.



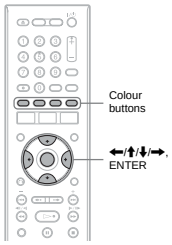
4 Select a character on the keyboard using ←/↑/↓/→, and press ENTER.
To switch between upper-case, lower-case, or characters with accents, press the yellow button ("Keyboard") repeatedly.
To cancel entering a new keyword, press the red button ("Back").
5 Repeat step 4 to enter the keyword.
6 Press the green button ("Save").
The entered keyword is registered.
To delete the keyword, select the keyword you want to delete, and press the red button ("Delete").
To change the keyword, select the keyword you want to change, and press the green button ("Edit").

To set a programme for timer recording
See "One Button Recording (GUIDE Plus+)" (page 56).

Hint
When two or more keywords are set for "My Choice," you can select "All."

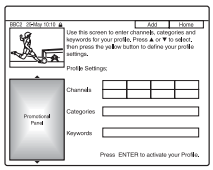
Listing Up Your Favourite Programme Information (My TV)

You can set a profile and list up only your favourite programme information.



Setting a profile

1 Select "My TV" in the Menu Bar.
2 Press the yellow button ("Profile").



→continued

3 Select "Channels," "Categories," or "Keywords," and press the yellow button ("Add").
"Channels": Select the programme position using ←/↑/↓/→, and press ENTER. To add more programme positions, press the yellow button ("Add"). You can register up to 16 programme positions.
To cancel the registration, select a programme position, and press the red button ("Delete").
"Categories": Select the category using ←/↑/↓/→, and press ENTER. To add more categories, press the yellow button ("Add"). You can register up to 4 categories.
To cancel the registration, select a category, and press the red button ("Delete").
"Keywords": Enter a keyword. See "To enter a new keyword" on page 49. To add more keywords, press the yellow button ("Add"). You can register up to 16 keywords.
To cancel the registration, select a keyword, and press the red button ("Delete").

4 Press ENTER.

To change the profile settings

1 Select "My TV" in the Menu Bar.
2 Press the yellow button ("Profile").
3 Repeat from step 3 above.

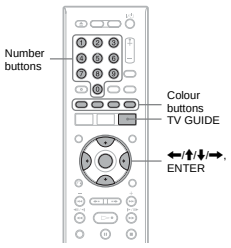
Selecting and watching a programme from My TV

1 Select "My TV" in the Menu Bar, and press ENTER.
The programmes that match the profile conditions are displayed.

2 Select a programme using ←/↑/↓/→, and press ENTER.

To set a programme for timer recording
See "One Button Recording (GUIDE Plus+)" (page 56).

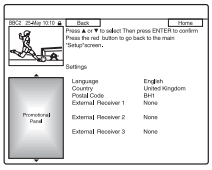
Making changes to the GUIDE Plus+ System



Changing the basic GUIDE Plus+ settings

All necessary settings are made when you complete Easy Setup (page 25). Follow the steps below only if you want to make changes to the current settings. Note that if you change the country/region setting, Easy Setup will begin again when you close the GUIDE Plus+ system.

1 Press TV GUIDE.
The GUIDE Plus+ system appears.
2 Select "Setup" in the Menu Bar.
The GUIDE Plus+ setup menu appears.
3 Select "Basic Setup" using ↑/↓, and press ENTER.



4 Select an item using ↑/↓, and press ENTER.
5 Select a setting using ↑/↓, and press ENTER.
"Language": Select a language for the on-screen displays using ↑/↓.
"Country": Select your country/region using ↑/↓.
When you exit the GUIDE Plus+ system after changing your country/region, the "Easy Setup" display appears. Follow the instructions for "Step 6: Easy Setup" (page 25) from step 2.
"Postal Code": Enter your postal code using ←/↑/↓/→. If "Country" is set to "Other," you cannot enter a postal code and the GUIDE Plus+ system will not search for a host channel.
"External Receiver 1"/"External Receiver 2"/"External Receiver 3": When a set top box receiver is connected to the recorder, set it up for the GUIDE Plus+ system. See "Setting up your set top box receiver for the GUIDE Plus+® system" on page 26.
6 Press TV GUIDE to exit the GUIDE Plus+ system.

To cancel GUIDE Plus+ settings
Press the red button ("Back").

To return to the "Home" position
Press the blue button ("Home").
The cursor returns to the home position on the "Grid."

Note
You cannot set "Easy Setup - Tuner System" in the "Easy Setup" or "OSD" in the "Basic" setup to a country/region or language that is not supported by the GUIDE Plus+ system.

Searching for the GUIDE Plus+ host channel

The default host channel setting is set to "Automatic," so you should not have to change the host channel setting. However, if the host channel has changed or moved, update the host channel setting.
If you made connection according to "B: Connecting a set top box receiver using a SCART cord only" (page 15), see "Changing the GUIDE Plus+ host channel manually" on page 52.

1 Press TV GUIDE.
The GUIDE Plus+ system appears.
2 Select "Setup" in the Menu Bar.
The GUIDE Plus+ setup menu appears.
3 Select "Host Channel Setup" using ↑/↓, and press ENTER.
4 Press the yellow button ("Reset").
5 Press I/⏻ to turn off the recorder.
6 Wait for a day until the programme guide data can be received.
If the programme guide data has not been received after waiting for a day, search for the host channel at the following website and set the host channel manually ("Changing the GUIDE Plus+ host channel manually" (page 52)).
www.europe.guideplus.com

→continued

Changing the GUIDE Plus+ host channel manually

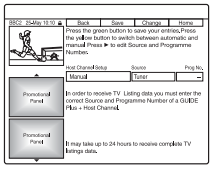
If you are using connection B (page 15) and you want to receive the programme guide data from your set top box receiver, search for the host channel on the following website and set it for your area, following the steps below:
www.europe.guideplus.com

1 Press TV GUIDE.
The GUIDE Plus+ system appears.

2 Select "Setup" in the Menu Bar.
The GUIDE Plus+ setup menu appears.

3 Select "Host Channel Setup" using ↑/↓, and press ENTER.

4 Press the yellow button ("Change") twice.
"Manual" appears.



5 Select "Source" using →.

6 Press the yellow button ("Source") repeatedly to select the input source.

7 Select "Prog. No." using →.

8 Enter the programme position number using the number buttons.

9 Press the green button ("Save").
The display asks for confirmation.

10 Select "Confirm" using ←/→, and press ENTER.
The display returns to the GUIDE Plus+ setup menu.

11 Wait one day until the programme guide data can be received.

To cancel the settings
Press the red button ("Back").

To return to the "Home" position
Press the blue button ("Home").
The cursor returns to the home position on the "Grid."

To check the GUIDE Plus+ system information

1 Press TV GUIDE.

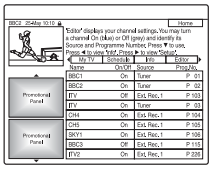
2 Select "Setup" in the Menu Bar, and press ENTER.

3 Select "GUIDE Plus+ system Information" using ↑/↓, and press ENTER.

Checking programme positions

Check whether programme position numbers are the same as the programme position numbers set in the "Programme Setting."
If you want to make adjustments to the channel settings or change the channel name, see "Programme Setting" in "Settings and Adjustments" (page 96).

1 Select "Editor" in the Menu Bar.



2 Press ENTER.

3 Press → to move the cursor to the right column.

4 Select the programme position you want to check using ↑/↓.
To change the input source, press the red button ("Source").
To change the programme position, see "Programme Setting" on page 96.

Note
To receive from the recorder a programme position that can be received by either the set top box receiver or the recorder, change the input source in step 4.

Disabling programme positions

If any programme positions are unused or contain unwanted channels, you can hide them.
For instance, if you are using your set top box receiver to receive programme data (connection B, page 15), all receivable programme positions are displayed. Use this function to hide any unwanted programme positions.

1 Select "Editor" in the Menu Bar, and press ENTER.

2 In the left column, select the programme position you want to hide or display using ↑/↓.

3 Press the red button ("On/Off").
The disabled positions will turn grey.
To show the disabled positions, press the red button ("On/Off") again.

Notes
- You cannot record a programme position, if it is not set in "Programme Setting" of "Settings and Adjustments," even if it is set to "On" in the "Editor" in the Menu Bar.
- If you are using your set top box receiver to receive programmes (connection B, page 15) and are able to receive the same programme with both the set top box and the recorder, change the "Source" to receive the programme with the recorder's tuner.

Timer Recording

Before Recording

Before you start recording…
- Check that the disc has enough available space for the recording (page 38). For the HDD, DVD+RWs, and DVD-RWs, you can free up disc space by erasing titles (page 78).
- Adjust the recording picture quality and picture size if necessary (page 60).

Hint
Timer recordings will be made regardless whether or not the recorder is turned on. You can turn off the recorder without affecting the recording even after recording starts.

Note
To play a recorded disc on other DVD equipment, finalise the disc (page 41).

Recording mode

Like the standard ×3 recording modes of video tapes, you can select the desired recording mode using the REC MODE button.
Recording modes with higher quality provide a more beautiful recording, but the large data volume also results in a shorter recording time.
Conversely, a longer duration provides a longer recording time, but the lower data volume results in a coarser picture quality.

Press REC MODE repeatedly to switch the recording modes.
To select the HQ+ mode, set "HQ Setting" of the "HDD Rec. Settings" to "HQ+" in the "Recording" setup (page 107). "HQ+" records pictures in higher quality than HQ on the HDD. Note that HQ+ appears as HQ in the front panel display and the on-screen displays.

Recording mode		Approx. recording time (hours)	
		HDD	DVD*
HQ+ (High quality)		20	–
HQ	↑	32	1
HSP	↑	46	1 hr. 30 min.
SP (Standard mode)		61	2
LSP	↓	77	2 hr. 30 min.
ESP	↓	93	3
LP	↓	124	4
EP	↓	187	6
SLP (Long duration)		249	8

* The recording time for DVD+R DL (Double Layer) discs is as follows:
HQ: 1 hour 48 minutes
HSP: 2 hours 42 minutes
SP: 3 hours 37 minutes
LSP: 4 hours 31 minutes
ESP: 5 hours 25 minutes
LP: 7 hours 14 minutes
EP: 10 hours 51 minutes
SLP: 14 hours 28 minutes

Notes
- The maximum continuous recording time for a single title is eight hours.
- Situations below may cause slight inaccuracies with the recording time.
  – Recording a programme with poor reception, or a programme or video source of low picture quality
  – Recording on a disc that has already been edited
  – Recording only a still picture or just sound

Recording stereo and bilingual programmes

The recorder automatically receives and records stereo and bilingual programmes based on the ZWEITON system or the NICAM system.
The HDD and a DVD-RW (VR mode) or DVD-R (VR mode) can record both main and sub sounds. You can switch between main and sub when playing the disc. For the HDD, you can select the sound track before recording. Select "Main," "Sub," or "Main+Sub" in "Bilingual Recording" of the "HDD Rec. Settings" in the "Recording" setup (page 106).
A DVD+RW, DVD-RW (Video mode), DVD+R, or DVD-R (Video mode) can record only one sound track (main or sub) at a time. Select the sound track using the Setup Display before recording starts. Set "Bilingual Recording" of the "DVD Rec. Settings" to "Main" (default) or "Sub" in the "Recording" setup (page 107).

ZWEITON (German stereo) system
When a stereo based programme is received, "Stereo" appears.
When a bilingual ZWEITON based programme is received, "Main," "Sub," or "Main/Sub" appears.

NICAM system
When a stereo or bilingual NICAM based programme is received, "NICAM" appears in the front panel display.
To record a NICAM programme, be sure to set "Audio" of "Programme Setting" in the "Basic" setup to "NICAM" (default). If the sound is not clear when listening to NICAM broadcasts, set "Audio" to "Standard" (see "Programme Setting" on page 96).

Hint
You can select the audio (main or sub) while recording bilingual programmes using the AUDIO button. This does not affect the recorded sound.

Unrecordable pictures

Pictures with copy protection cannot be recorded on this recorder.
When the recorder receives a copy guard signal, the recorder continues to record but only a blank, grey coloured screen will be recorded.

Copy control signals	Recordable discs
Copy-Free	HDD +RW -RWVR -RWVideo +R -RVR -RVideo
Copy-Once	HDD -RWVR (CPRM*) -RVR (CPRM*)
Copy-Never	None (a blank screen is recorded)

* The recorded disc can be played only on CPRM compatible equipment (page 8).

Timer Recording (GUIDE Plus+/ShowView/ Manual)

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

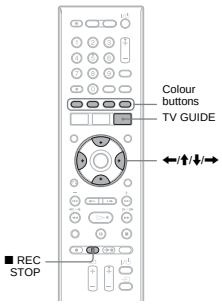
There are three methods to setting the timer within the GUIDE Plus+ system: One Button Recording, ShowView, and setting the timer manually.

Notes

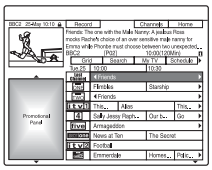
- When the recorder is connected to a set top box receiver and you want to record using the GUIDE Plus+ system, turn on the set top box receiver and connect the set top box controller.
- Do not operate your set top box receiver just before or during a timer recording. This may prevent the accurate recording of a programme.

One Button Recording (GUIDE Plus+)

You can use the GUIDE Plus+ system to set the timer to record a programme up to seven days in advance.



1 Press TV GUIDE.



2 Select a programme using ←/↑/↓/→.

To search for a programme by category or by keyword, select “Search” in the Menu Bar. See “Searching for a Programme using the GUIDE Plus+ System” on page 48 for more information about searching for a programme.
You can select a programme from “My TV.”

3 Press the red button (“Record”).

The set programme and Time Slot change colour and the recorder is ready to start recording. When recording from a set top box receiver, be sure to turn it on. Unlike a VCR, there is no need to turn off the recorder before the timer recording starts.

- To record on a DVD
  See “Checking/Changing/Cancelling Timer Settings” on page 61.
- To make more detailed timer settings
  See “Checking/Changing/Cancelling Timer Settings” on page 61.

To confirm, change, or cancel a timer recording

See “Checking/Changing/Cancelling Timer Settings” on page 61.

To stop recording during timer recording

Press ■ REC STOP.
Note that it may take a few seconds for the recorder to stop recording, and that the recording cannot be stopped within the first minute of recording.

To adjust the recording quality

See step 3 of “Adjusting the recording picture quality and size” on page 60.

Rec. Mode Adjust

If there is not enough available disc space for the recording, the recorder automatically adjusts the recording mode to enable the entire programme to be recorded. Set “Rec. Mode Adjust” of the “Timer Settings” to “On” in the “Recording” setup (page 107).

Auto Title Erase (HDD only)

If there is not enough space for a timer recording, the recorder automatically erases old titles recorded on the HDD.
The oldest played title is erased. Set “Auto Title Erase” of the “Timer Settings” to “On” in the “Recording” setup (page 107).
Protected titles are not erased.

If the timer settings overlap

If one or more timer settings overlap, a message appears. To change the timer settings, see “Checking/Changing/Cancelling Timer Settings” on page 61.

Hint

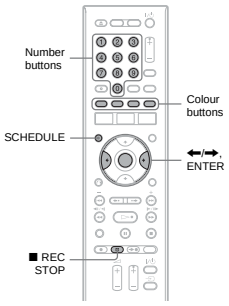
If you are recording to the HDD or a DVD-RW (VR mode) at a recording mode that is SP or lower and is a 2x-speed or higher disc, you can play the title as it is being recorded by selecting the programme title on the Title List (page 71).

Notes

- If a message indicating that the disc is full appears on the screen, change the disc, or make available space for the recording (HDD/DVD+RW/DVD-RW only) (page 79).
- The last recording mode you selected manually becomes the default recording mode for timer recordings made from the GUIDE Plus+ system.
- You cannot adjust the recording quality (HDD or DVD) once the recording starts.
- The beginning of some recordings may not be made when using the PDC/VPS function.
- You cannot extend the recording duration time when “PDC/VPS” is set to “On” (page 62).

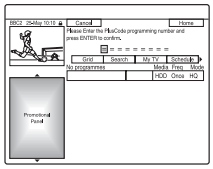
Recording TV programmes using the ShowView system

The ShowView system is a feature that simplifies setting the timer. Just enter the ShowView programming number listed in the TV programme guide. The date, time, and programme position of that programme are set automatically.
Check that the programme positions are correctly set in “Programme Setting” in the “Basic” setup (page 96).



1 With the GUIDE Plus+ system turned off, press SCHEDULE.

2 Press the red button (“ShowView”).



3 Press the number buttons to enter the ShowView programming number.

- If you make a mistake, press ← and re-enter the correct number.

→continued

4 Press ENTER.

The date, start and stop times, programme position, etc. setting appear. The recorder is ready to start recording.

- To record on a DVD
  See “Checking/Changing/Cancelling Timer Settings” on page 61.
- To make more detailed timer settings
  See “Checking/Changing/Cancelling Timer Settings” on page 61.

To confirm, change, or cancel a timer recording

See “Checking/Changing/Cancelling Timer Settings” on page 61.

To stop recording during timer recording

Press ■ REC STOP.
Note that it may take a few seconds for the recorder to stop recording.

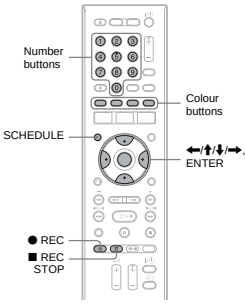
Rec. Mode Adjust

If there is not enough available disc space for the recording, the recorder automatically adjusts the recording mode to enable the entire programme to be recorded. Set “Rec. Mode Adjust” of the “Timer Settings” to “On” in the “Recording” setup (page 107).

Auto Title Erase (HDD only)

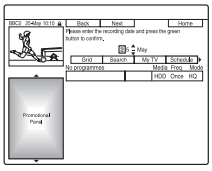
If there is not enough space for a timer recording, the recorder automatically erases old titles recorded on the HDD.
The oldest played title is erased. Set “Auto Title Erase” of the “Timer Settings” to “On” in the “Recording” setup (page 107).
Protected titles are not erased.

Setting the timer manually



1 With the GUIDE Plus+ system turned off, press SCHEDULE.

2 Press the green button (“Manual”).



3 Set the date using the number buttons and ←/↑/↓/→. Then press the green button (“Next”).

4 Set the start time using the number buttons and ←/↑/↓/→. Then press the green button (“Next”).

5 Set the stop time using the number buttons and ←/↑/↓/→. Then press the green button (“Next”).

6 Select the input source using ↑/↓, and select the programme position using the number buttons or ↑/↓.

You can also select the programme position using the yellow button (“Channels”).

7 Press the green button (“Next”).

The display for entering characters appears.
To change the title name, select a character on the keyboard using ←/↑/↓/→, and press ENTER.
To switch between upper-case, lower-case, or characters with accents, press the yellow button (“Keyboard”).

8 Press the green button (“Save”).

The date, start and stop times, programme position, etc. setting appear. The recorder is ready to start recording.

To confirm, change, or cancel a timer recording

See “Checking/Changing/Cancelling Timer Settings” on page 61.

To stop recording during timer recording

Press ■ REC STOP.
Note that it may take a few seconds for the recorder to stop recording.

Rec. Mode Adjust

If there is not enough available disc space for the recording, the recorder automatically adjusts the recording mode to enable the entire programme to be recorded. Set “Rec. Mode Adjust” in the “Recording” setup to “On” (page 107).

Auto Title Erase (HDD only)

If there is not enough space for a timer recording, the recorder automatically erases old titles recorded on the HDD.
Set “Auto Title Erase” in the “Recording” setup to “On” (page 107). The oldest played title is erased. Protected titles are not erased.

If the timer settings overlap

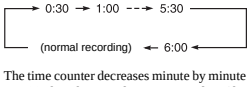
If one or more timer settings overlap, a message appears. To change the timer settings, see “Checking/Changing/Cancelling Timer Settings” on page 61.

Using the Quick Timer function

You can set the recorder to record in 30 minute increments.

Press ● REC repeatedly to set the duration.

Each press advances the time in 30 minute increments. The maximum duration is six hours.



The time counter decreases minute by minute to 0:00, then the recorder stops recording (the power does not turn off). Even if you turn off the recorder during recording, the recorder continues to record until the time counter runs out.
Note that the Quick Timer function does not work if “TV Direct Rec.” is set to “On” in the “Recording” setup (page 107).

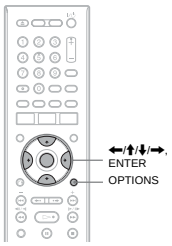
To cancel the Quick Timer

Press ● REC repeatedly until the counter appears in the front panel display. The recorder returns to normal recording mode.

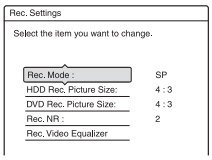
→continued

Adjusting the recording picture quality and size

You can adjust the recording picture quality and picture size.



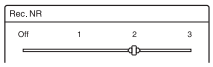
1 Before recording starts, press OPTIONS to select "Rec. Settings," and press ENTER.


Rec. Settings
Select the item you want to change.
Rec. Mode : SP
HDD Rec. Picture Size: 4 : 3
DVD Rec. Picture Size: 4 : 3
Rec. NR : 2
Rec. Video Equalizer

2 Select the item you want to adjust, and press ENTER.

The adjustment display appears.

Example: Rec. NR



"Rec. Mode":
Selects the recording mode for the desired recording time and picture quality. For more information, see "Recording mode" on page 54.

"HDD Rec. Picture Size"/"DVD Rec. Picture Size":
Sets the picture size of the programme to be recorded.
- 4 : 3 (default): Sets the picture size to 4:3.
- 16 : 9: Sets the picture size to 16:9 (wide mode).
- Auto (HDD only): Automatically selects the actual picture size.

"DVD Rec. Picture Size" works with DVD-RWs/DVD-Rs (Video mode) when the recording mode is set to HQ, HSP, SP, LSP, or ESP. For all other recording modes, the screen size is fixed at "4 : 3."
For DVD-Rs/DVD-RWs (VR mode), the actual picture size is recorded regardless of the setting. For example, if a 16:9 size picture is received, the disc records the picture as 16:9 even if "DVD Rec. Picture Size" is set to "4 : 3."
For DVD+RWs/DVD+Rs, the screen size is fixed at "4 : 3."

"Rec. NR" (noise reduction): Reduces noise contained in the video signal.

"Rec. Video Equalizer": Adjusts the picture in greater detail.
Press ↑/↓ to select the item you want to adjust, then press ENTER.
- Contrast: Changes the contrast.
- Brightness: Changes the overall brightness.
- Colour: Makes the colours deeper or lighter.

3 Adjust the setting using ←/↑/↓/→, and press ENTER.

The default setting is underlined.
"Rec. NR": (weak) Off 1 ~ 2 ~ 3 (strong)
"Rec. Video Equalizer":
- Contrast: (weak) –3 ~ 0 ~ 3 (strong)
- Brightness: (dark) –3 ~ 0 ~ 3 (bright)
- Colour: (light) –3 ~ 0 ~ 3 (deep)

Repeat steps 2 and 3 to adjust any other items.

Notes
- If one programme contains two picture sizes, the selected size is recorded. However, if the 16:9 signal cannot be recorded as 16:9, it is recorded as 4:3.
- When playing a 16:9 size picture recorded as 4:3, the image is fixed to 4:3 Letter Box regardless of the setting in "TV Type" of "Video" setup (page 101).
- Remnants of images may appear on your screen when using "Rec. NR."
- "Rec. Video Equalizer" does not affect the input of the DV IN jack and does not work with RGB signals.

Creating chapters in a title

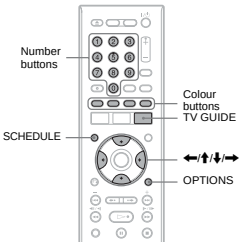
The recorder can automatically divide a recording (a title) into chapters by inserting chapter marks at approximately 6 minute intervals during recording. To disable this function, set "Auto Chapter" in the "Recording" setup to "Off" (page 107).
When recording to the HDD, a DVD-R (VR mode) or a DVD-RW (VR mode), you can insert and erase chapter marks manually (page 81).

Note
When dubbing (page 85), the chapter marks in the dubbing source are not retained in the dubbed title.

Checking/Changing/ Cancelling Timer Settings

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

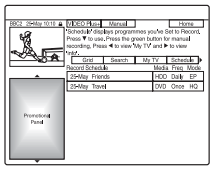
You can change or cancel timer settings using the SCHEDULE list.



Changing timer settings

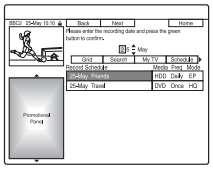
1 With the GUIDE Plus+ system turned off, press SCHEDULE.

The SCHEDULE list appears.



2 Select the timer setting you want to change using ↑/↓.

3 Press the green button ("Edit").



4 In the left column, select an item using the red button ("Back") or the green button ("Next"), and adjust using the number buttons or ←/↑/↓/→.

You can change the date, start time, stop time, programme position, or input source.
The cursor moves to the right column.

5 Press the corresponding colour button repeatedly to change settings.
- Red button ("Media"): Sets the recording destination to either HDD or DVD.
- Green button ("Frequency"): Selects the recording pattern. The item changes as follows:
  Once ⟶ Daily ⟶ Mon-Fri (Monday to Friday) ⟶ Mon-Sat (Monday to Saturday) ⟶ Sun (every Sunday) ⟶ ..... ⟶ Sat (every Saturday) ⟶ Once
- Yellow button ("Rec Mode"): Selects the recording mode (page 54).

6 Press ➡ to display "Extend Time."

7 Press the yellow button ("Extend Time") repeatedly to select the duration time or to set the PDC/VPS function.

The item changes as follows:
+0 Minutes ⟶ +10 Minutes ⟶ +30 Minutes ⟶ +60 Minutes ⟶ VPS / PDC ⟶ +0 Minutes
See "About the PDC/VPS function" below.

Hint
You can also extend the recording time while recording by pressing OPTIONS and selecting "Extend Rec.."

Note
The new settings become effective when you exit the GUIDE Plus+ system.

About the PDC/VPS function

PDC/VPS signals are transmitted with TV programmes in some broadcast systems. These signals ensure that timer recordings are made regardless of any broadcast delays, early starts, or broadcast interruptions.

◆To use the PDC/VPS function

Select "VPS / PDC" in step 7 above.
When you turn on this function, the recorder starts scanning the channels before the timer recording starts. If you are watching TV when scanning starts, a message will appear on the TV screen. If you want to watch TV, switch to your TV's tuner or turn off the PDC/VPS channel scan function.
Note that if you turn off the PDC/VPS channel scan function, the timer recording will not start.

◆To temporarily turn off PDC/VPS channel scan

Press OPTIONS and select "PDC/VPS Scan Off."
To ensure that the PDC/VPS function works properly, turn off the recorder before the timer recording starts. This will automatically turn on the PDC/VPS channel scan function while the recorder remains off.

Cancelling timer settings

1 With the GUIDE Plus+ system turned off, press SCHEDULE.

The SCHEDULE list appears.

2 Select the timer setting you want to cancel using ↑/↓.

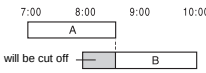
3 Press the red button ("Delete").

To close the SCHEDULE list

Press TV GUIDE or SCHEDULE.

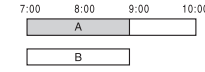
When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished.



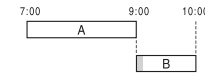
◆When the recordings start at the same time

The programme that is set last has priority. In this example, timer setting B is set after A, so the first part of timer setting A will not be recorded.



◆When the end time of one recording and the start time of another are the same

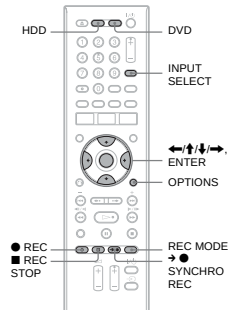
After finishing the previous recording, the other recording may be delayed.



Note
When "PDC/VPS" is set to "On" for one or more timer recordings, the start times may change in the event of a broadcast delay or early start.

Recording From Connected Equipment

HDD +RW -RWVR -RWVideo +R -RVR -RVideo



Recording from connected equipment with a timer (Synchro Rec)

You can set the recorder to automatically record programmes from connected equipment that has a timer function (such as a satellite tuner). Connect the equipment to the LINE 3/DECODER jack of the recorder (page 28).
When the connected equipment turns on, the recorder starts recording a programme from the LINE 3/DECODER jack.

1 Before recording, select HDD or DVD.

If you select DVD, insert a recordable DVD (see "1. Inserting a Disc" on page 33).

2 Set "Synchro Rec." to "Record to HDD" or "Record to DVD" in the "Recording" setup (page 107).

3 Press INPUT SELECT repeatedly to select "L3."

4 Select the desired audio signal when recording a bilingual programme to the HDD or DVD-RWs/DVD-Rs (VR mode).
Press OPTIONS to select "Line Audio Input," and press ENTER. Then select "Bilingual," and press ENTER.
For details about bilingual recording, see page 55.

5 Press REC MODE repeatedly to select the recording mode.
For details about the recording mode, see page 54.

6 Set the timer on the connected equipment to the time of the programme you want to record, and turn it off.

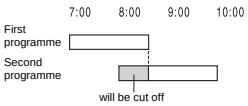
7 Press → ● SYNCHRO REC.
The SYNCHRO REC indicator lights up on the front panel. The recorder is ready to start Synchro-Recording.
The recorder automatically starts recording when it receives an input signal from the connected equipment. The recorder stops recording when the connected equipment turns off.

To stop recording
Press ■ REC STOP or → ● SYNCHRO REC.

To cancel Synchro Rec
Press → ● SYNCHRO REC.
The SYNCHRO REC indicator on the recorder turns off.

Notes
- The recorder starts recording only after detecting a special control signal from the connected equipment. The beginning of the programme may not be recorded regardless of whether or not the recorder's power is on or off.
- During Synchro-Recording, other operations, such as normal recording, cannot be performed.
- To use the connected equipment while the recorder is standing by for Synchro-Recording, cancel Synchro-Recording by pressing → ● SYNCHRO REC. Be sure to turn off the connected equipment and press → ● SYNCHRO REC to reset Synchro-Recording before the timer recording starts.
- The Synchro Rec function does not work when "Line3 Input" of "Scart Setting" is set to "Decoder" in the "Video" setup (page 103).
- The Synchro Rec function does not work with some tuners. For details, see the tuner's operating instructions.
- While the recorder is standing by for Synchro-Recording, the Auto Clock Set function (page 100) does not work.
- To use the Synchro Rec function, you must first set the recorder's clock correctly.

If the timer settings of a Synchro-Recording and another timer recording overlap
Regardless of whether or not the programme is a Synchro Rec programme, the programme that starts first has priority and the second programme starts recording only after the first programme has finished.

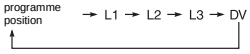


Recording from connected equipment without a timer

You can record from a connected VCR or similar device. To connect a VCR or similar device, see "Connecting a VCR or Similar Device" on page 28. Use the DV IN jack on the front panel if the equipment has a DV output jack (i.LINK jack).

1 Press HDD or DVD.
If you select DVD, insert a recordable DVD (see "1. Inserting a Disc" on page 33).

2 Press INPUT SELECT to select an input source according to the connection you made.
The front panel display changes as follows:



3 Select the desired audio signal when recording a bilingual programme to the HDD or DVD-RWs/DVD-Rs (VR mode).
Press OPTIONS to select "Line Audio Input," and press ENTER. Then select "Bilingual," and press ENTER.
For details about bilingual recording, see page 55.

4 Press REC MODE repeatedly to select the recording mode.
For details about the recording mode, see page 54.

5 Insert the source tape into the connected equipment and set to playback pause.

6 Press ● REC.
This recorder starts recording.

7 Press the pause (or play) button on the connected equipment to cancel the playback pause status.
The connected equipment starts playback and the playback image is recorded by this recorder.
To stop recording, press ■ REC STOP on this recorder.

If you connect a digital video camera with a DV IN jack
See "DV Dubbing" on page 91 for an explanation of how to record from the DV IN jack.

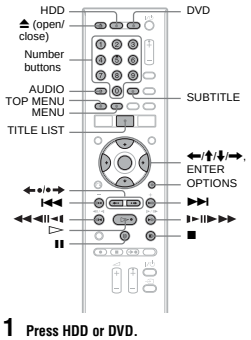
Hint
You can adjust the settings for the recording picture before recording. See "Adjusting the recording picture quality and size" on page 60.

Notes
- When recording a video game image, the screen may not be clear.
- Any programme that contains a Copy-Never copy guard signal cannot be recorded. The recorder continues to record, but a blank screen will be recorded.

Playback

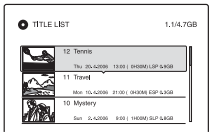
Playing

HDD +RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD CD DATA DVD DATA CD



1 Press HDD or DVD.
- If you select DVD, insert a disc (see "1. Inserting a Disc" on page 33).
- If you insert a DVD VIDEO, VIDEO CD, CD, DATA DVD, or DATA CD, press ▷. Playback starts.

2 Press TITLE LIST.
For details about the Title List, see "3. Playing the Recorded Programme (Title List)" on page 35.
Example: DVD+RW



3 Select the title, and press ENTER.
The sub-menu appears.

4 Select "Play," and press ENTER.
Playback starts from the selected title.

To use the DVD's Menu
When you play a DVD VIDEO, or a finalised DVD+RW, DVD-RW (Video mode), DVD+R, or DVD-R (Video mode), you can display the disc's menu by pressing TOP MENU or MENU.

To play VIDEO CDs with PBC functions
PBC (Playback Control) allows you to play VIDEO CDs interactively using the menu on your TV screen.
When you start playing a VIDEO CD with PBC functions, the menu appears.
Select an item using the number buttons and press ENTER. Then, follow the instructions in the menu (press ▷ when "Press SELECT" appears).
The PBC function of Super VIDEO CDs does not work with this recorder. Super VIDEO CDs are played in continuous play mode only.

To change the angles
If various angles (multi-angles) for a scene are recorded on the disc, " " appears in the front panel display. Press OPTIONS during playback to select "Change Angle," and press ENTER.

To stop playback
Press ■.

To playback quickly with sound (Scan Audio)
When you press ►► during playback of a title recorded in the HDD, you can play quickly with dialogue or sound ("x1.3" appears).
No sound is output when you press ►► two or more times to change search speed.

To resume playback from the point where you stopped (Resume Play)
When you press ▷ again after you stop playback, the recorder resumes playback from the point where you pressed ■.
To start from the beginning, press OPTIONS to select "Play Beginning," and press ENTER. Playback starts from the beginning of the title/track/scene.

The point where you stopped playing is cleared when:
– you open the disc tray (except for HDD).
– you play another title (except for HDD).
– you switch the Title List menu to Original or Playlist (HDD/DVD-RWs/DVD-Rs in VR mode only).
– you edit the title after stopping playback.
– you change the settings on the recorder.
– you turn off the recorder (VIDEO CD/CD/DATA DVD/DATA CD only).
– you make a recording (except for HDD/DVD-RWs/DVD-Rs in VR mode).
– you disconnect the mains lead.

Note
You cannot resume playback during TV Pause.

To play restricted DVDs (Parental Control)
If you play a restricted DVD, the message "Do you want to temporarily change the Parental Control level to *?" appears on your TV screen.

1 Select "OK" and press ENTER.
The display for entering your password appears.

2 Enter your four-digit password using the number buttons.

3 Press ENTER to select "OK."
The recorder starts playback.

To register or change the password, see "Parental Control (DVD VIDEO only)" on page 108.

To lock the disc tray (Child Lock)
You can lock the disc tray to prevent children from ejecting the disc.
When the recorder is turned on, hold down ■ until "LOCKED" appears in the front panel display. The ≜ (open/close) button does not work while the Child Lock is set.

To unlock the disc tray, hold down ■ until "UNLOCKED" appears in the front panel display when the recorder is turned on.

One Touch Play
If you use the SMARTLINK connection, you can easily start playing.
Press ▷. The recorder and your TV automatically turn on and the TV's input is switched to the recorder. Playback starts automatically.

One Touch Menu
If you use the SMARTLINK connection, you can easily display the Title List.
Press TITLE LIST. The recorder and your TV automatically turn on and the TV's input is switched to the recorder. The Title List appears.

Hints
- You can also use the ▷ button in step 3 (page 66) to start playback.
- Even if you select "Factory Setup" in the "Others" setup (page 110), the Child Lock remains set.

→continued

Playback options

To check the position of the buttons below, see the illustration on page 66.
For MP3, JPEG, or DivX operations, see "Playing MP3 Audio Tracks, JPEG Image Files, or DivX® Video Files" on page 73.

Buttons	Operations
AUDIO HDD -RWVR -RVR DVD VCD CD	Selects one of the audio tracks recorded on the disc when pressed repeatedly in normal playback mode. DVD : Selects the language. HDD -RWVR -RVR : Selects the main or sub sound. VCD CD : Selects stereo or monaural audio tracks.
SUBTITLE DVD	Selects a subtitle language when pressed repeatedly.
⏮•/•⏭ (instant replay/ instant advance) HDD +RW -RWVR -RWVideo +R -RVR -RVideo DVD	Replays the scene/briefly fast forwards the scene.
⏮ (previous)/⏭ (next)	Goes to the beginning of the previous/next title/chapter/scene/ track. For the HDD, you cannot go to the beginning of the previous/ next title.
◀◀ (fast reverse/fast forward)	Fast reverses/fast forwards the disc when pressed during playback. Search speed changes as follows: fast reverse: ◀◀1 ← ◀◀2 ← ◀◀3*2 ← ← ← fast forward: → 1▶▶*1 → → 2▶▶ → → → 3▶▶*2 When you press and hold the button, fast forward/fast reverse continues at the selected speed until you release the button. *1 When you press ▶▶ once during playback of a title recorded in the HDD, you can play quickly with sound ("x1.3" appears). *2 ◀◀3 and 3▶▶ are only available for the HDD and DVDs.
◀◀ ◀II ◀ / ▶ II▶ ▶▶ (slow, freeze frame) HDD +RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD * * Playback direction only	Plays in slow motion when pressed for more than one second in pause mode. Plays one frame at a time when pressed briefly in pause mode.
II (pause)	Pauses playback.

To resume normal playback, press ▷.

Notes
- Angles and subtitles cannot be changed with titles recorded on this recorder.
- Slideshows made with a DVD camcorder can only be played. Other play functions, such as fast forward, cannot be used.

Notes on playing DTS sound tracks on a CD
- When playing DTS-encoded CDs, excessive noise will be heard from the LINE1-TV/LINE 3/ DECODER/LINE 2 OUT (R-AUDIO-L) jacks. To avoid possible damage to the audio system, the consumer should take proper precautions when the LINE1-TV/LINE 3/DECODER/LINE 2 OUT (R-AUDIO-L) jacks of the recorder are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external DTS decoder must be connected to the DIGITAL OUT jack of the recorder.
- Set the sound to "Stereo" using the AUDIO button when you play DTS sound tracks on a CD (page 68).

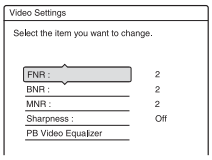
Notes on playing DVDs with a DTS sound track
DTS audio signals are output only through the DIGITAL OUT (COAXIAL or OPTICAL) jack. When you play a DVD with DTS sound tracks, set "DTS" to "On" in the "Audio" setup (page 104).

Adjusting the picture quality

HDD +RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD DATA DVD * DATA CD *

* DivX video file only

1 Press OPTIONS during playback to select "Video Settings," and press ENTER.



2 Select an item, and press ENTER.
The adjustment display appears.
"FNR" (frame noise reduction):
Reduces noise contained in the luminance element of the video signal.
"BNR" (block noise reduction):
Reduces "block noise" or mosaic like patterns in the picture.
"MNR" (mosquito noise reduction):
Reduces the faint noise appearing around the outlines of the images. The noise reduction effects are automatically adjusted within each setting range according to the video bit rate and other factors.
"Sharpness":
Sharpens the outlines of the images.
"PB Video Equalizer" (Playback video equalizer):
Adjusts the picture in greater detail.
Select an item and press ENTER.
- Contrast: changes the contrast.
- Brightness: changes the overall brightness.
- Colour: makes the colours deeper or lighter.
- Hue: changes the colour balance.

3 Press ←/→ to adjust the setting, and press ENTER.
The default settings are underlined.
"FNR": (weak) Off 1 2 3 (strong)
"BNR": (weak) Off 1 2 3 (strong)
"MNR": (weak) Off 1 2 3 (strong)
"Sharpness"*: (weak) Off 1 2 3 (strong)
"PB Video Equalizer":
- Contrast: (weak) –3 ~ 0 ~ 3 (strong)
- Brightness: (dark) –3 ~ 0 ~ 3 (bright)
- Colour: (light) –3 ~ 0 ~ 3 (deep)
- Hue: (red) –3 ~ 0 ~ 3 (green)

Repeat steps 2 and 3 to adjust any other items.
* "1" softens the outlines of the images. "2" enhances the outlines and "3" enhances them more than "2."

➡continued

Notes
- If the outlines of the images on your screen become blurred, set "BNR" and/or "MNR" to "Off."
- Depending on the disc or the scene being played, the above BNR, MNR, or FNR effects may be hard to discern. And, these functions may not work with some screen sizes.
- When using the "Sharpness" function, noise found in the title may become more apparent. In this case, it is recommended that you use the BNR function with the "Sharpness" function. If the condition still does not improve, set the "Sharpness" level to "Off."

Adjusting the delay between the picture and sound (AV SYNC)

HDD +RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD DATA DVD DATA CD

1 Press OPTIONS during playback to select "Audio Settings," and press ENTER.

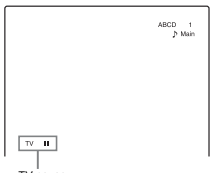
2 Select "AV SYNC," and press ENTER.
"AV SYNC":
When the video is delayed, this function delays the audio for synchronization with the video (0 to 120 milliseconds). Larger numbers indicate a longer audio delay for synchronization with the video. When dubbing to a VCR or other video recording equipment, be sure to return this setting to 0 ms (default).

3 Press ←/→ to adjust the setting, and press ENTER.

Pausing a TV Broadcast (TV Pause/Pause Live TV)

You can pause a current TV broadcast, and then continue watching the programme at a later time. This is useful when you receive an unexpected phone call or visitor while watching TV.

1 While viewing a TV broadcast with this recorder, press II.
The picture pauses. You can pause the picture for up to three hours.



TV pause

2 Press II or ▷ again to resume watching the programme.

Notes
- Paused titles are not saved to the HDD.
- This function is cancelled when:
  – ■ (stop) is pressed.
  – PROG +/– is pressed.
  – DVD is pressed.
  – ⏏ (open/close) is pressed.
  – TITLE LIST is pressed.
  – INPUT SELECT is pressed.
  – the recorder is turned off.
  – a timer recording or Synchro-Recording is started.
  – the PDC/VPS function is "On" and channel scan is started.
  – DV dubbing or regular dubbing is started.
- It may take one minute or more to resume playback of the paused programme.
- Even if you fast forward the recorded programme, there will always be a time difference of about one minute or more between the recorded programme and the current TV broadcast.

Playing from the beginning of the programme you are recording (Chasing Playback)

HDD -RWVR

"Chasing Playback" allows you to view the recorded part of a programme while the recording is being made. You do not need to wait until the recording finishes.

Press OPTIONS while recording to select "Chasing Playback," and press ENTER.
Playback starts from the beginning of the programme you are recording.
When you fast forward to the point that you are recording, Chasing Playback returns to normal playback.

Notes
- For DVD-RWs (VR mode), this function does not work when recording:
  – on a 1x-speed DVD-RW.
  – in the HQ or HSP recording mode.
- The DVD's picture on your TV screen freezes for a few seconds when you fast forward/fast reverse or instant replay/advance the recording.
- Chasing Playback is possible from one minute or more after recording starts.
- Even if you fast forward the recorded programme, there will always be a time difference of about one minute or more between the recorded programme and the current TV broadcast.

Playing a previous recording while making another (Simultaneous Rec and Play)

HDD +RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD CD DATA DVD DATA CD

"Simultaneous Rec and Play" allows you to view a previously recorded programme while recording programmes. Playback continues even if a timer recording starts. Use this function as follows:
- While recording to the HDD:
  Play another title on the HDD.
  Play a previously recorded programme on a DVD by pressing DVD.
- While recording to a DVD:
  Play a previously recorded programme on the HDD by pressing HDD.
- While recording to a DVD-RW (VR mode)*1:
  Play another title on the same DVD-RW (VR mode) disc.*2

*1 Simultaneous Rec and Play function does not work when you record:
– on a 1x-speed DVD-RW.
– in the HQ or HSP recording mode.

*2 Picture noise may appear depending upon the condition of the recording, or when playing a title recorded in the HQ or HSP recording mode. The picture freezes for a few seconds when you use fast forward/fast reverse or instant replay/ advance.

You can also play a DVD VIDEO, VIDEO CD, Super VIDEO CD, CD, DATA DVD, or DATA CD while recording on the HDD.

Example: Play another title on the HDD while recording to the HDD.
1 While recording, press TITLE LIST to display the HDD Title List.
2 Select the title you want to play, and press ENTER.
3 Select "Play" from the sub-menu, and press ENTER.
Playback starts from the selected title.

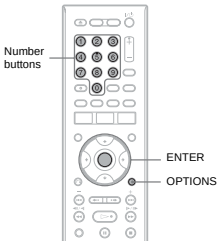
Example: Play a DVD while recording to the HDD.
1 While recording, press DVD and insert the DVD into the recorder.
2 Press TITLE LIST to display the DVD Title List.
3 Select the title you want to play, and press ENTER.
4 Select "Play" from the sub-menu, and press ENTER.
Playback starts from the selected title.

Note
You cannot play a DVD, DivX video or VIDEO CD recorded in the NTSC colour system while recording on the HDD. When playing a DivX video or VIDEO CD, be sure to set "Colour System" to "PAL" in the "Video" setup (page 103).

Searching for a Title/ Chapter/Track, etc.

HDD +RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD CD DATA DVD DATA CD

You can search a disc by title, chapter, scene or track. As titles and tracks are assigned individual numbers, select the title or track by entering its number. You can also search for a scene using the time code.



1 Press OPTIONS during playback to select a search method, and press ENTER.

"Title Search" (for DVDs)
"Chapter Search" (for HDD/DVDs)
"Track Search" (for CDs/DATA CDs)
"Search" (for VIDEO CDs)
"Album Search" (for DATA DVDs/ DATA CDs)
"Time Search" (for HDD/DVDs/DATA DVDs*/DATA CDs*): Searches for a starting point by entering the time code.
* DivX video file only
"File Search" (for DATA DVDs/DATA CDs)

The display for entering the number appears.
Example: Title Search

The number in parentheses indicates the total number of titles, tracks, etc.

2 Press the number buttons to select the number of the title, chapter, track, time code, etc., you want.

For example: Time Search
To find a scene at 2 hours, 10 minutes, and 20 seconds, enter "21020."
If you make a mistake, select another number.

3 Press ENTER.

The recorder starts playback from the selected number.

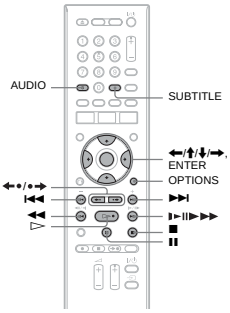
Note

"Title Search" is not applicable to the HDD.

Playing MP3 Audio Tracks, JPEG Image Files, or DivX® Video Files

DATA DVD DATA CD

You can play MP3 audio tracks, JPEG image files, and DivX video files on DATA CDs (CD-ROMs/CD-Rs/CD-RWs) or JPEG image files and DivX video files on DATA DVDs (DVD-ROMs/DVD+RWs/DVD+Rs/ DVD-RWs/DVD-Rs).



1 Insert a disc.

See "1. Inserting a Disc" on page 33.

2 Press ▷.

For MP3 discs, playback starts from the first MP3 audio track on the disc.
For JPEG files, a slideshow of the pictures on the disc begins.
For DivX video files, playback starts from the first DivX video file on the disc.
If the disc contains MP3 audio tracks, JPEG image files, and DivX video files, only the DivX video files are played back when ▷ is pressed.
If the disc contains MP3 audio tracks and JPEG image files, only the JPEG image files are played back when ▷ is pressed.

To stop playback or slideshow

Press ■.

To pause playback or slideshow

Press II.

To play the beginning of the MP3 audio track or DivX video file

Press OPTIONS to select "Play Beginning," and press ENTER.

To fast forward or fast reverse an MP3 audio track or DivX video file

Press ◀◀/▶▶ during playback.

To go to the next or previous MP3 audio track, JPEG image file or DivX video file

Press I◀◀ or ▶▶I during playback. If you repeatedly press I◀◀ or ▶▶I, you will go to the next or previous album. (Except JPEG image file)

To play DivX video file in slow motion/one frame at a time (Playback direction only)

Press >/II▶ in pause mode.

To go to the next or previous album (Except for DivX video files)

Press ←•/•→ during playback or slideshow.

To display the registration code for this recorder

Select "Registration Code" in the "Others" setup (page 110).

→continued

To rotate a picture

Press OPTIONS while the JPEG image is displayed to select "Rotate Right" or "Rotate Left," and press ENTER.

Hints

- Press AUDIO to switch between stereo or monaural audio tracks when playing MP3 audio tracks.
- You can change the audio track when playing MP3 or MPEG audio of DivX video files using the AUDIO button.
- You can display subtitles when playing DivX video files using the SUBTITLE button.
- You can rotate a JPEG image using the ←/→ buttons when the image is displayed.

Notes

- Some JPEG files, especially files of three million pixels or more, may lengthen the slideshow interval.
- Rotated JPEG images will not be saved when you switch to another folder.
- Images larger than 720 × 480 will be reduced to 720 × 480 when displayed.
- The following images are not displayed:
  – progressive JPEG image files
  – greyscale JPEG image files
  – 4:1:1 JPEG image files
- When you attempt to play a broken file or a file that does not satisfy the play conditions, appears but the recorder cannot play the file.
- The recorder cannot play a DivX video file of size more than 720 (width) × 576 (height)/4 GB.

About MP3 audio tracks, JPEG image files, and DivX video files

MP3 is an audio compression technology that satisfies certain ISO/MPEG regulations.
JPEG is an image compression technology.
You can play MP3 (MPEG1 Audio Layer 3) format audio tracks and JPEG image files on DATA CDs (CD-ROMs/CD-Rs/CD-RWs) or JPEG image files on DATA DVDs (DVD-ROMs/DVD+RWs/DVD+Rs/DVD-RWs/ DVD-Rs).
DATA CDs and DATA DVDs must be recorded according to ISO9660 Level 1, Level 2 or Joliet format for the recorder to recognize the DivX video files and JPEG image files.
DATA CDs must be recorded according to ISO9660 Level 1, Level 2 or Joliet format for the recorder to recognize the MP3 tracks.
DivX® is a video file compression technology, developed by DivX, Inc. This product is an official DivX® Certified product. You can play DATA CDs and DATA DVDs that contain DivX video files. You can also play discs recorded in MultiSession/Border.
See the instructions supplied with the disc drives and the recording software (not supplied) for details on the recording format.

Note on MultiSession/Border discs

If audio tracks and images in Music CD format or Video CD format are recorded in the first session/border, only the first session/ border will be played back.

Note

The recorder may not be able to play some DATA CDs/DATA DVDs created in the Packet Write format.

MP3 audio tracks, JPEG image files, or DivX video files that the recorder can play

The recorder can play the following tracks and files:
– MP3 audio tracks with the extension ".mp3."
– JPEG image files with the extension ".jpeg" or ".jpg."
– JPEG image files that conform to the DCF* image file format.
– DivX video file with the extension ".avi" or ".divx."

* "Design rule for Camera File system": Image standards for digital cameras regulated by JEITA (Japan Electronics and Information Technology Industries Association).

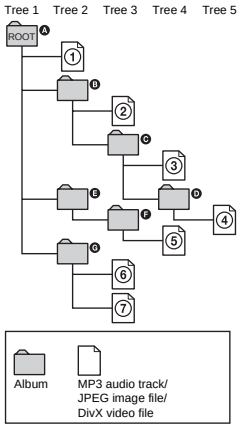
Notes

- The recorder will play any data with the extension ".mp3," ".jpeg," ".jpg," ".avi," or ".divx" even if they are not in MP3, JPEG, or DivX format. Playing these data may generate a loud noise which could damage your speaker system.
- The recorder does not conform to audio tracks in mp3PRO format.
- The recorder may not play a DivX video file when the file has been combined from two or more DivX video files.
- Depending on the disc, normal playback may not be possible. For example, the picture may be unclear, playback may not appear smooth, the sound may skip, and so on.
- Depending on the disc, playback may take some time to start.
- Some files cannot be played.

About playback order of albums, tracks, and files

Albums play in the following order:

Structure of disc contents



When you insert a DATA CD/DATA DVD and press ▷, the numbered tracks (or files) are played sequentially, from ① through ⑦. For JPEG image files, press •→ to go to the next album. (For instance, when you want to go from ① to ②.) Any sub-albums/tracks (or files) contained within a currently selected album take priority over the next album in the same tree. (Example: C contains D so ④ is played before ⑤.)

Hints

- If you add numbers (01, 02, 03, etc.) to the front of the track/file names when you store the tracks (or files) in a disc, the tracks and files will be played in that order.
- Since a disc with many trees takes longer to start playback, it is recommended that you create albums with no more than two trees.

→continued

Notes

- Depending on the software you use to create the DATA DVD/DATA CD, the playback order may differ from the above illustration.
- No more than a total of 999 individual folders can be played. (Folders that do not contain JPEG/MP3/DivX files are counted as well.)
- No more than a total of 999 folders and 9999 files can be played. (Files other than JPEG/MP3/DivX files, and folders that do not contain JPEG/MP3/DivX files are counted as well.)
- No more than 999 folders and files can be recognized in a single folder. (Folders that do not contain JPEG/MP3/DivX files are counted as well.)
- Proceeding to the next or another album may take some time.
- This recorder supports MP3 audio bit rates up to 320 kbps.

Before Editing

This recorder offers various edit options for various disc types.

Notes

- You may lose the edited contents if you remove the disc or a timer recording starts while editing.
- DVD discs created by DVD video cameras cannot be edited on this recorder.
- If a message appears and indicates that the disc's control information is full, erase or edit unnecessary titles.
- When editing a DVD+R or DVD-R, finish all editing before finalising the disc. You cannot edit a finalised disc.

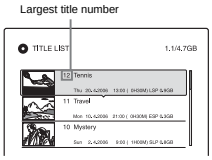
Edit features	HDD		-RWVR -RVR		+RW -RWVideo +R -RVideo
	Original title	Playlist title	Original title	Playlist title	
Erase (page 78)	Yes	Yes	Yes	Yes	Yes
Protect (page 78)	Yes	Yes	Yes	No	Yes
Title Name (page 78)	Yes	Yes	Yes	Yes	Yes
A-B Erase (page 79)	Yes	Yes	Yes	Yes	Yes*
Erase Titles (page 79)	Yes	Yes	Yes	Yes	Yes
Divide (page 80)	Yes	Yes	No	Yes	No
Set Thumbnail (page 78)	Yes	Yes	Yes	Yes	No
Chapter mark (page 81)	Yes	Yes	Yes	Yes	No
Creating and Editing a Playlist (page 81)	Yes	Yes	Yes	Yes	No
Change Order (page 83)	No	No	No	Yes	No
Combine (page 83)	No	Yes	No	Yes	No

* DVD+RW only

➡continued

To open up disc space

To open up disc space on a DVD+RW or DVD-RW (Video mode), erase the title with the largest number in the title list.



For the HDD and DVD-RWs (VR mode), you can erase any title.
For DVD-Rs and DVD+Rs, the available disc space does not increase even if you erase titles.
See "Erasing and Editing a Title" on page 78 or "Erasing multiple titles (Erase Titles)" on page 79.

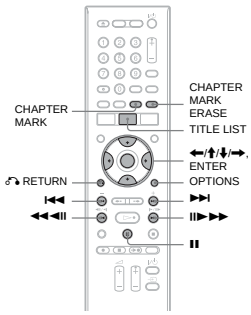
To switch between the Playlist and Original Title List

You can display the Playlist titles in the Title List (Playlist), or the Original titles in the Title List (Original). To switch the two Title Lists, press ←/→ while a Title List is displayed. To create and edit a Playlist, see page 81.

Erasing and Editing a Title

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

This section explains the basic edit functions. Note that editing is irreversible. To edit the HDD or DVD-RWs/DVD-Rs (VR mode) without changing the original recordings, create a Playlist title (page 81).



1 Press TITLE LIST.
For HDD titles or DVD-RWs/DVD-Rs in VR mode, press ←/→ to switch the Title Lists, if necessary.

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select an option, and press ENTER.
You can make the following edits to the title.
"Erase": Erases the selected title. Select "OK" when asked for confirmation.
"Protect": Protects the title. "🔒" appears next to the protected title.
"Title Name": Allows you to enter or re-enter a title name (page 39).
"A-B Erase": Erases a section of the title (page 79).
"Divide": Divides a title into two titles (page 80).
"Set Thumbnail": Changes the title's thumbnail picture that appears in the Title List (page 36).
"Make a Playlist": Adds the entire title to the Playlist title as one scene (page 83).

Hints

- You can erase multiple titles at one time (page 79).
- You can automatically erase titles that have already played (page 107).
- You can label or re-label DVDs (page 40).

Note

DVD-RW/DVD-R (VR mode) playlist titles cannot be protected.

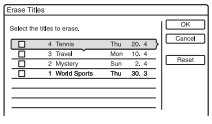
Erasing multiple titles (Erase Titles)

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

You can select and erase more than one title at one time using the OPTIONS menu.

1 Press TITLE LIST.
For HDD titles or DVD-RWs/DVD-Rs in VR mode, press ←/→ to switch the Title Lists, if necessary.

2 Press OPTIONS to select "Erase Titles," and press ENTER.
The display for selecting titles to be erased appears.



3 Select a title, and press ENTER.
A check mark appears in the check box next to the selected title.
- To clear the check mark, press ENTER again.
- To clear all of check marks, select "Reset."

4 Repeat step 3 to select all of the titles you want to erase.

➡continued

5 When you finish selecting titles, select "OK," and press ENTER.
The list of the titles to be erased appears for confirmation.
- To change the selection, select "Change," and repeat from step 3.

6 Select "OK" and press ENTER.
The titles are erased.

To erase all titles on the disc

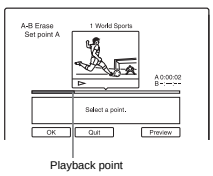
You can reformat the HDD, DVD+RW, or DVD-RW to make the disc or drive blank.
To format the HDD, see "Format" on page 110.
To format a DVD+RW or DVD-RW disc, see "8. Reformatting a disc" on page 43.

Erasing a section of a title (A-B Erase)

HDD +RW -RWVR -RVR

You can select a section (scene) in a title and erase it. Note that erasing scenes in a title cannot be undone.

1 After step 2 of "Erasing and Editing a Title," select "A-B Erase" and press ENTER.
The display for setting point A appears. The title starts to play.
- To return to the beginning of the title, press II and then press I◄◄.



2 Select point A using ◄◄/►►, and press ENTER.
Playback pauses.

3 Press ENTER if point A is correct.
If point A is incorrect, select point A using ◀II/II▶, and press ENTER. The display for setting point B appears.

4 Select point B using ◀◀/▶▶, and press ENTER.
Playback pauses.

5 Press ENTER if point B is correct.
If point B is incorrect, select point B using ◀II/II▶, and press ENTER. The display asks for confirmation.
- To reset point A, press ↑ and ↩ RETURN, and go to step 2.
- To reset point B, press ↑ and repeat step 4.
- To preview the title without scenes to be erased, select "Preview" (except for DVD+RWs).

6 Select "OK," and press ENTER.
The scene is erased. The display for setting point A appears.
- To continue, go to step 2.
- To finish, select "Quit."

Hint
A chapter mark is inserted after the scene was erased. The chapter mark divides the title into separate chapters on either side of the mark.

Notes
- Images or sound may be momentarily interrupted at the point where you erase a section of a title.
- Sections shorter than five seconds may not be erased.
- For DVD+RWs, the erased section may be slightly different from the points you selected.

Dividing a title (Divide)

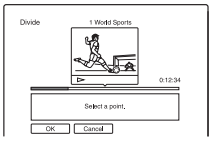
HDD -RWVR* -RVR*

If you want to dub a long title to a disc but do not want to reduce the picture quality, divide the title into two shorter titles. Note that dividing a title cannot be undone.
* Only playlist titles can be divided for DVD-RWs/DVD-Rs (VR mode).

1 Press TITLE LIST.
Press ←/→ to switch the Title Lists, if necessary.

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select "Divide," and press ENTER.
The display for setting the dividing point appears, and the title starts to play.
- To return to the beginning of the title, press ▮▮ and then press ⏮.



4 Select the dividing point by pressing ◀◀/▶▶, and press ENTER.
Playback pauses.

5 Press ENTER if the dividing point is correct.
If the dividing point is incorrect, select the dividing point using ◀II/II▶, and press ENTER. The display asks for confirmation.
- To change the dividing point, press ↑.

6 Select "OK," and press ENTER.
The title is divided in two.

Hint
After a title is divided, the title name prior to division is assigned to both the first and second parts.

Creating chapters manually

HDD -RWVR -RVR

You can manually insert a chapter mark at any point you like during playback or recording.

Press CHAPTER MARK at the point where you want to divide the title into chapters.
Each time you press the button, "Marking ..." appears on the screen and the scenes to the left and right of the mark become separate chapters.

To erase chapter marks
You can combine two chapters by erasing the chapter mark during playback.
Press ⏮/⏭ to search for a chapter number, and while displaying the chapter containing the chapter mark you want to erase, press CHAPTER MARK ERASE. The current chapter combines with the previous chapter.

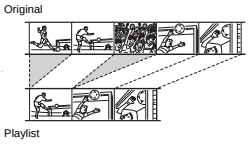
Notes
- When dubbing, any chapter marks you enter will be erased.
- To insert a chapter mark manually during recording, set "Auto Chapter" to "Off" in the "Recording" setup (page 107).

Creating and Editing a Playlist

HDD -RWVR -RVR

Playlist edit allows you to edit or re-edit without changing the actual recordings. You can create up to 97 Playlist titles.

Example: You have recorded the final few matches of a football tournament on a DVD-RW/DVD-R (VR mode). You want to create a digest with the goal scenes and other highlights, but you also want to keep the original recording.



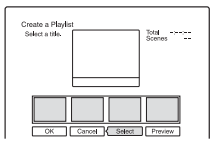
In this case, you can compile highlight scenes as a Playlist title. You can even rearrange the scene order within the Playlist title.
The Playlist title calls up data from the original titles for playback. When an original title is used for a Playlist title, the original title cannot be edited and erased.

Note
Playlist titles containing titles recorded with the "Copy-Once" copy protection signal cannot be dubbed or moved (page 87).

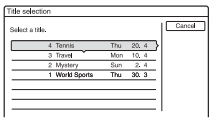
→continued

1 Press TITLE LIST.
If the Title List (Original) appears, press ←.

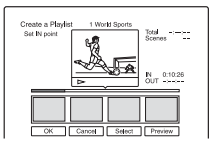
2 Press OPTIONS to select "Create a Playlist," and press ENTER.



3 Select "Select," and press ENTER.



4 Select the title you want to include in the Playlist title, and press ENTER.
The display for setting the start point (IN) appears. The title starts to play.
- To return to the beginning of the title, press ▮▮ and then press ⏮.



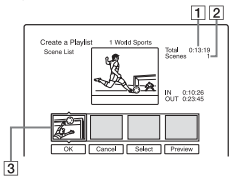
5 Select the IN point using ◀◀/▶▶, and press ENTER.
Playback pauses.

6 Press ENTER if the IN point is correct.
If the IN point is incorrect, select the IN point using ◀II/II▶, and press ENTER. The display for setting the end point (OUT) appears.

7 Select the OUT point using ◀◀/▶▶, and press ENTER.
Playback pauses.

8 Press ENTER if the OUT point is correct.
If the OUT point is incorrect, select the OUT point using ◀II/II▶, and press ENTER.
The selected scene is added to the scene list.
- To add more scenes, go to step 5.

9 When you finish adding scenes, press ↓.



1 Total duration of the selected scene
2 Total number of scenes
3 Selected scene

10 Select the scene you want to re-edit, and press ENTER.
The sub-menu appears.
"Move": Changes the scene order using ←/→ and press ENTER.
"Erase": Erases the scene. When asked for confirmation, select "OK."
- To add more scenes, press ↑ and go to step 5.
- To add more scenes from another title, select "Select" and go to step 4.
- To preview all of the captured scenes in the listed order, select "Preview."

11 When you finish editing the scene list, select "OK," and press ENTER.
The title of the created Playlist is added to the Title List (Playlist). The title name is the title name of the first scene.

Hint
When a Playlist title is created, the IN and OUT points will become chapter marks, and each scene will become a chapter.

Note
The picture may pause when the edited scene is played.

To add the entire title to the Playlist title as one scene (Make a Playlist)

1 Press TITLE LIST. If the Title List (Playlist) appears, press →.

2 Select the title and press ENTER.
The sub-menu appears.

3 Select "Make a Playlist," and press ENTER.
The selected title is added to the Title List (Playlist).
The title name is the same as the Original title name.

To play the Playlist title

1 Press TITLE LIST. If the Title List (Original) appears, press ←.

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select "Play," and press ENTER.

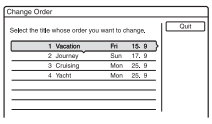
Moving a Playlist title (Change Order)

-RWVR -RVR

You can change the Playlist title order within the Title List (Playlist).

1 Press TITLE LIST.
If the Title List (Original) appears, press ←.

2 Press OPTIONS to select "Change Order," and press ENTER.


Change Order
Select the title whose order you want to change.
Quit
1 Vacation Fri 15, 9
2 Journey Sun 17, 9
3 Cruising Mon 25, 9
4 Yacht Mon 25, 9

3 Select the title you want to move, and press ENTER.

4 Select a new location for the title using ↑/↓, and press ENTER.
The title moves to the new location.
- To move more titles, go to step 3.
- To finish, select "Quit," and press ENTER.

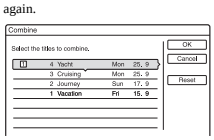
Combining multiple Playlist titles (Combine)

HDD -RWVR -RVR

1 Press TITLE LIST.
If the Title List (Original) menu appears, press ←.

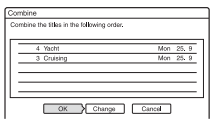
2 Press OPTIONS to select "Combine," and press ENTER.
The display for selecting titles appears.

3 Select a title, and press ENTER.
A number indicating the order in which you selected the title appears.
To cancel the selection, press ENTER again.



4 Repeat step 3 to select all of the titles you want to combine.
To cancel all of the selections, select "Reset."

5 Select "OK," and press ENTER.
The list of titles to be combined appears.
To change the selection, select "Change" and go to step 3.



6 Select "OK," and press ENTER.
The titles are combined.

→continued

Hint
After titles are combined, the title name is the title name of the first title prior to combination.

Note
When the number of chapters in the title to be combined exceeds the limit, the chapters at the end are combined into a single chapter.

Dividing a Playlist title (Divide)

HDD -RWVR -RVR

You can divide a Playlist title. For operations, see page 80.

Before Dubbing

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

In this section, "dubbing" refers to "copying a recorded title on the internal hard disk drive (HDD) to another disc, or vice versa." You can select to dub one title at a time (Title Dubbing – see "Dubbing a single title (Title Dubbing)" on page 88), or multiple titles all at once (Multiple Title Dubbing – see "Dubbing multiple titles (Dub Selected Titles)" on page 89).
Before you start, read the following precautions, which are common to both dubbing methods.

If you want to record from a digital video camera connected to the DV IN jack, see "DV Dubbing" on page 91. To record from equipment connected to the LINE IN jacks, see "Recording from connected equipment without a timer" on page 65.

Before you start…

- You cannot record both the main and sub sound on DVD+RWs, DVD-RWs (Video mode), DVD+Rs, or DVD-Rs (Video mode). For bilingual programmes, set "Bilingual Recording" of "DVD Rec. Settings" to either "Main" (default) or "Sub" in the "Recording" setup (page 107).
- The chapter marks in the dubbing source are not retained in the dubbed title. When "Auto Chapter" is set to "On" in the "Recording" setup (page 107), chapter marks are automatically inserted at approximately 6 minute intervals.

Hints
- When you dub a Playlist title, it is recorded as an Original title.
- When dubbed from a DVD to the HDD, the picture size and the sound types originally recorded are retained.

Notes
- You cannot make a recording while dubbing.
- To play a dubbed disc on other DVD equipment, finalise the disc (page 41).
- You cannot dub from DVD VIDEOs to the HDD.
- Thumbnails that you have set for the originally recorded title (page 36) will not be retained in the dubbed title.
- When dubbing to a DVD+R DL disc, the video may be momentarily interrupted at the point where the layers switch.

About "Dub Mode"

With this recorder, the recording mode for dubbing is displayed as "Dub Mode." Three dubbing methods are available: High-speed Dubbing, Original Dubbing, and Rec Mode Conversion Dubbing. Read the following and select according to the required time, disc space, and picture quality.

Dubbing at high-speed (High-speed Dubbing)

HDD ➡ +RW / -RWVR / -RWVideo / +R / -RVR / -RVideo

Allows you to dub what you have stored in the HDD to a high-speed DVD (8x-speed DVD+RWs/6x-speed DVD-RWs/16x-speed DVD+Rs/16x-speed DVD-Rs, or slower versions of each disc type), without changing the recording mode.
Set "Dub Mode" to "Fast" in the steps of "Dubbing a single title (Title Dubbing)" (page 88) or "Dubbing multiple titles (Dub Selected Titles)" (page 89).
When dubbing multiple titles, you can select "Fast" if there are one or more titles that can be dubbed at high speed in the selected titles. However, titles that cannot be dubbed at high speed are dubbed in the Original Dubbing mode.
The minimum required time is as follows (approximate).

➡continued

Required times for High-speed Dubbing from HDD to DVD (for 60-minute programme)*1

Speed*2	6x	6x	8x	8x	2.4x
Rec. mode	High-speed DVD-RW	High-speed DVD+RW	High-speed DVD-R	High-speed DVD+R	DVD+R (Double Layer)
HQ	Approx. 10 min.	Approx. 10 min.	Approx. 8 min.	Approx. 8 min.	Approx. 25 min.
HSP	Approx. 6 min. 40 sec.	Approx. 6 min. 40 sec.	Approx. 5 min.	Approx. 5 min.	Approx. 16 min. 40 sec.
SP	Approx. 5 min.	Approx. 5 min.	Approx. 3 min. 45 sec.	Approx. 3 min. 45 sec.	Approx. 12 min. 30 sec.
LSP	Approx. 4 min.	Approx. 4 min.	Approx. 3 min.	Approx. 3 min.	Approx. 10 min.
ESP	Approx. 3 min. 20 sec.	Approx. 3 min. 20 sec.	Approx. 2 min. 30 sec.	Approx. 2 min. 30 sec.	Approx. 8 min. 20 sec.
LP	Approx. 2 min. 30 sec.	Approx. 2 min. 30 sec.	Approx. 2 min.	Approx. 2 min.	Approx. 6 min. 15 sec.
EP	Approx. 1 min. 40 sec.	Approx. 60 min.*3	Approx. 1 min. 15 sec.	Approx. 60 min.*3	Approx. 60 min.*3
SLP	Approx. 1 min. 15 sec.	Approx. 60 min.*3	Approx. 56 sec.	Approx. 60 min.*3	Approx. 60 min.*3

*1 The values in the above table are for reference only. Actual times for dubbing also require time for creating disc's control information and other data.
*2 This is the maximum recording speed of this recorder. The recording speed cannot exceed the value indicated in the above table even when using discs that support higher recording speeds. In addition, depending on the disc condition, the recorder may be unable to record at the maximum recording speed indicated in the table.
*3 High-speed dubbing is not available when dubbing titles recorded in EP and SLP mode to DVD+RWs and DVD+Rs.

Notes
- High-speed Dubbing is not available for the following titles:
  – Titles recorded in HQ+.
  – Titles that contain both main and sub sounds (except DVD-RWs/DVD-Rs (VR mode)).
  – Titles recorded in mixed picture size (4:3 and 16:9 etc.) (except DVD-RWs/DVD-Rs (VR mode)).
  – Dubbing from DVD to HDD
  – Dubbing 16:9 size title from HDD to DVD+RW/DVD+R
  – When dubbing a title with a picture size of 16:9 recorded in LP, EP, or SLP mode to a DVD-RW or DVD-R in Video mode.
- When dubbed to a DVD-RW (Video mode)/ DVD+RW/DVD+R/DVD-R (Video mode), the "seams" that are left over from editing may remain on the disc. If you edit a title, use the Original Dubbing or Rec Mode Conversion Dubbing method. This will smooth out the "seams."

Original Dubbing

HDD ⟷ +RW / -RWVR / -RWVideo / +R / -RVR / -RVideo

Original Dubbing allows you to make smooth dubbings by de-emphasizing the "seams" that are left over from editing. In this case, the recording mode is set to the same recording mode that the source title was recorded in.
To set the "Dub Mode" to "Original," you must make your selection from the "Dub Selected Titles" display (page 89).
Note that you cannot select "Original" when using the Dubbing method explained in "Dubbing a single title (Title Dubbing)" (page 88).

Note
If the recording mode of the dubbing source title is unknown when dubbing from a DVD to the HDD, "Dub Mode" is automatically set to "SP" in the "Dub Selected Titles" display (page 89).

Rec Mode Conversion Dubbing

HDD ⟷ +RW / -RWVR / -RWVideo / +R / -RVR / -RVideo

Allows you to dub from the HDD to a DVD or vice versa, in a dubbing mode that differs from the original recordings. For example, when you dub an HQ title (data size is large) in SP mode, you can reduce the data size, saving more titles using less space.
Select a mode different from the original recording in "Dub Mode" in the steps of "Dubbing a single title (Title Dubbing)" (page 88) or "Dubbing multiple titles (Dub Selected Titles)" (page 89). When dubbing multiple titles, all of the selected titles will be recorded in same recording mode.

Hint
Dubbing in the recording mode of the source title smoothes out the "seams" that are left over from editing.

Notes
- For a title whose picture size (16:9 or 4:3) is mixed:
  – When dubbed from the HDD to DVD-RWs/ DVD-Rs (Video mode), the picture size is determined by the setting in "DVD Rec. Picture Size" (page 60).
  – When dubbed from the HDD to DVD-RWs/ DVD-Rs (Video mode) in LP, EP or SLP mode, the picture size is always 4:3.
  – When dubbed from HDD to DVD+RW or DVD+R, the picture size is always 4:3.
- The picture quality will not improve even if a title is converted to a recording mode of better picture quality.

Dubbing restriction

You cannot dub movies and other DVD VIDEOs to the HDD. Also, when dubbing from a DVD to the HDD, a grey, blank screen will be recorded for scenes that contain a copy protection signal.

Copy protection signals	Dubbing
Copy-Free (No copy protection signal)	HDD ⟷ +RW / -RWVR / -RWVideo / +R / -RVR / -RVideo
Copy-Once	HDD ➡ -RWVR * / -RVR *

* CPRM-compatible DVD-RWs/DVD-Rs (VR mode) only
CPRM (Content Protection for Recordable Media) is a coding technology that protects copyrights for images.

Move

HDD ➡ -RWVR / -RVR

Titles containing "Copy-Once" copy protection signals can be moved only from HDD to DVD-RW/DVD-R (VR mode)* (after the title is moved, the original title in the HDD is erased). The "Move" function is performed using the same procedure as dubbing (page 88). Titles containing "Copy-Once" copy protection signals are indicated with COPY.

Notes
- The following titles in the HDD cannot be moved.
  – Protected titles
  – Playlist titles
  – Original titles referenced from the playlist
- When dubbing (Move) is stopped partway, no part of the title will be moved to the dubbing target. However, note that this will decrease the free disc space for DVD+Rs/DVD-Rs.
- Even if you erase a scene that contains a copy protection signal, the recording restrictions on that title are retained.

* CPRM-compatible DVD-RWs/DVD-Rs (VR mode) only.

Dubbing

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

Dubbing a single title (Title Dubbing)

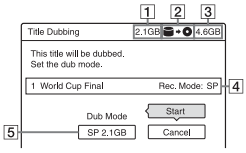
1 Insert the DVD that you are going to dub to or from.

2 Press HDD or DVD to select the source.

3 Press TITLE LIST.
Press ←/→ to switch the Title Lists, if necessary.

4 Select a title, and press ENTER.
The sub-menu appears.

5 Select "Dubbing," and press ENTER.
The display for selecting the dubbing mode appears.
If a title with COPY (page 87) is selected in the title list, a confirmation display is displayed.
To "Move," select "OK."



1 Size of the title (approximate)
This is displayed in red when the size exceeds the available space on the dubbing target media.

2 Direction of dubbing

3 Available space on the disc to be dubbed (approximate)

4 Information about the title to be dubbed

5 Dubbing mode and the space that remains after dubbing (approximate)

6 Select "Dub Mode."

7 Select a dubbing mode using ↑/↓.

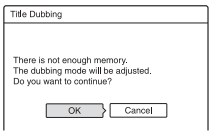
Fast* → HQ → HSP → SP → LSP
↳ SLP ← EP ← LP ← ESP ↲

* From the HDD to a DVD only.
Appears when High-speed Dubbing is available for the title (page 85).

8 Select "Start," and press ENTER.
The remaining time of dubbing appears in the front panel display.

To automatically adjust the dubbing mode

If there is not enough available space on the target disc, the recorder automatically selects a dubbing mode with lower picture quality according to the available space. If there is insufficient disc space in the selected dubbing mode, the following display appears after step 8.



Select "OK" and go to step 8.
To manually select another dubbing mode, select "Cancel," and go to step 7.

To stop dubbing

Press OPTIONS to select "Stop Dubbing," and press ENTER. When asked for confirmation, select "OK," and press ENTER.
When dubbing (Move) is stopped partway, no part of the title will be moved to the dubbing target. However, note that this will decrease the free disc space for DVD+Rs/DVD-Rs.

Hint
You can turn off the recorder during dubbing. The recorder completes dubbing even after being turned off.

To stop dubbing

Press OPTIONS to select "Stop Dubbing," and press ENTER. When asked for confirmation, select "OK," and press ENTER.
When dubbing (Move) is stopped partway, no part of the title will be moved to the dubbing target. However, note that this will decrease the free disc space for DVD+Rs/DVD-Rs.

Hint
You can turn off the recorder during dubbing. The recorder completes dubbing even after being turned off.

Dubbing multiple titles (Dub Selected Titles)

A maximum of 30 selected titles can be dubbed at once.

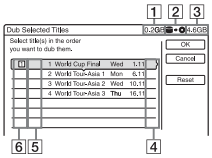
1 Insert the DVD that you are going to dub to or from.

2 Press HDD or DVD to select the source.

3 Press TITLE LIST.
Press ←/→ to switch the Title Lists, if necessary.

4 Press OPTIONS to select "Dub Selected Titles," and press ENTER.

5 Select titles in the order you want to dub, and press ENTER.
The titles are numbered in the selected order.
- To cancel the selection, press ENTER again.
- To cancel all of the selections, select "Reset."



1 Total size of the selected titles
This is displayed in red when the size exceeds the available space on the dubbing target media.

2 Direction of dubbing

3 Available space on the disc to be dubbed (approximate)

4 "PL": Indicates a Playlist title.

5 COPY : Indicates titles containing "Copy-Once" copy protection signals (page 87). When you select a title with COPY, the display asks for confirmation. To "Move," select "OK."

6 Order of dubbing

6 Repeat step 5 to select all of the titles you want to dub.

7 Select "OK," and press ENTER.
The display for selecting the dubbing mode appears.

8 Select a dubbing mode using ↑/↓.

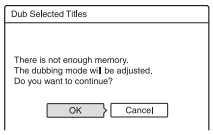
Fast* → Original → HQ → HSP → SP
↳ SLP ← EP ← LP ← ESP ← LSP ↲

* From the HDD to a DVD only.
Appears when available for the title (page 85).

9 Select "Start," and press ENTER.
The remaining time of dubbing appears in the front panel display.

To automatically adjust the dubbing mode

If there is not enough available space on the target disc, the recorder automatically selects a dubbing mode with lower picture quality according to the available space. The same dubbing mode is set for all of the titles. If disc space is insufficient for the selected dubbing mode, the following display appears after step 9 of "Dubbing multiple titles (Dub Selected Titles)" on page 89.



Select "OK" and go to step 9.
To manually select another dubbing mode, select "Cancel," and go to step 8.

DV Dubbing

Before DV Dubbing

This section explains dubbing with a digital video camera via the DV IN jack on the front panel. If you want to dub by way of the LINE IN jacks, see "Recording from connected equipment without a timer" on page 65.
The DV IN jack on this recorder conforms to the i.LINK standard.
Follow the instructions in "Preparing for DV dubbing," and then move on to the section on dubbing. For more information about i.LINK, see "About i.LINK" on page 123.

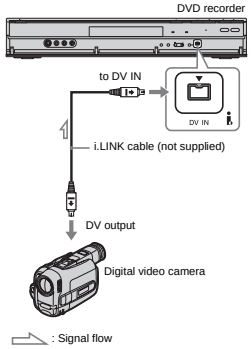
Preparing for DV dubbing

You can connect a digital video camera to the DV IN jack on the recorder to record or edit from a DV/Digital8 format tape. Operation is straightforward because the recorder will fast forward and rewind the tape for you – you do not need to operate your digital video camera. Do the following to start using the "DV Edit" functions of this recorder.
See the instruction manual supplied with the digital video camera as well before connecting.

Hint
If you plan to do additional editing on a disc after the initial dub, use the DV IN jack and record on a DVD-RW/DVD-R (VR mode) or HDD.

Notes
- You cannot make a recording while DV dubbing.
- The DV IN jack is for input only. It will not output signals.
- You cannot use the DV IN jack when:
  – signal input to the DV IN jack on the front panel or recorder operation cannot be performed correctly when using a digital video camera (see "About i.LINK" on page 123). Connect the camera to the LINE IN jack and follow the instructions of "Recording from connected equipment without a timer" on page 65.
  – the input signal is not in DVC-SD format. Do not connect a MICRO MV format digital video camera even if it has an i.LINK jack.
  – the images on the tape contain copy protection signals, which limit recording.
- If you want to play the disc on other DVD equipment, finalise the disc (page 41).

Hookups

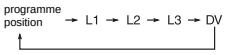


1 Press HDD or DVD to select the recording destination.
If you select DVD, insert a disc (see "1. Inserting a Disc" on page 33).

2 Insert the source DV/Digital8 format tape into your digital video camera.
For the recorder to record or edit, your digital video camera must be set to video playback mode.

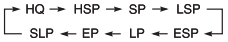
3 Press INPUT SELECT on the remote repeatedly to select "DV."

The front panel display changes as follows:



4 Press REC MODE on the remote repeatedly to select the recording mode.

The recording mode changes as follows:



For details about the recording mode, see page 54.

5 Press OPTIONS on the remote to select "DV Audio Input," and press ENTER. Then, select the setting for the audio input.

"Stereo1" (default): Records original sound only. Normally select this when dubbing a DV format tape.
"Mix": Records both stereo 1 and 2.
"Stereo2": Records additional audio only.
Select "Mix" or "Stereo2" only if you have added a second audio channel when recording with your digital video camera.
You are ready to start dubbing. Select one of the dubbing methods on the following pages.

6 Adjust the dubbing picture quality and size.

Before dubbing starts, press OPTIONS to select "Rec. Settings," and adjust the recording settings (page 60).

Hint

You can turn off the recorder during dubbing. The recorder completes dubbing even after being turned off.

Notes

- You cannot connect more than one piece of digital video equipment to the recorder.
- You cannot control the recorder using another device or another recorder of the same model.
- You cannot record date, time, or the contents of the cassette memory onto the disc.
- If you record from a DV/Digital8 format tape that is recorded in multiple sound tracks, such as a tape with multiple sampling frequencies (48 kHz, 44.1 kHz, or 32 kHz), no sound or an unnatural sound will be output when playing back the sampling frequency switch point on the disc.
- In order to use this recorder's "Auto Chapter" setting (page 93, 94), be sure to correctly set the clock on your digital video camera before shooting.
- The recorded picture may be momentarily affected or the start and end points of a title may be different from what you have set if the source DV/Digital8 format tape is in any of the following conditions. In this case, see "Recording from connected equipment without a timer" (page 65).
  – There is a blank space in the recorded portion of the tape.
  – The tape's time code is not sequential.
  – If the picture size or the recording mode on the tape being dubbed changes.

Recording an Entire DV Format Tape (One Touch Dubbing)

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

You can record the entire contents of a DV/Digital8 format tape onto a disc with a single press of the ONE-TOUCH DUB button on the recorder. The recorder controls the digital video camera for the whole process, and completes the recording.

◆How chapters are created

The contents dubbed to the HDD or DVD become a single title. When "Auto Chapter" is set to "On" in the "Recording" setup, this title is divided into chapters. When dubbing to the HDD or a DVD-RW/DVD-R (VR mode), each shooting session on the tape becomes a chapter on the disc. For other discs, the recorder divides the title into chapters at approximately 6 minute intervals.

Follow steps 1 to 6 of "Preparing for DV dubbing" on page 91, and press ONE-TOUCH DUB on the recorder.

The recorder rewinds the tape and then starts recording the tape contents.
When the recording is finished, the recorder rewinds the tape in the digital video camera.

To stop during recording

Press ■ REC STOP.
Note that it may take a few seconds for the recorder to stop recording.

Hints

- If you set "Finalise Disc" of "One Touch Dubbing" to "Auto" in the "DVD" setup (page 109), the recorded disc (except DVD-RW (VR mode)) will automatically be finalised after recording is finished.
- You can play back a previously recorded title on the HDD while One Touch Dubbing is in progress.

Notes

- When a blank space between the recordings on the tape continues for more than five minutes, One Touch Dubbing ends automatically.
- The recorder records a blank for five minutes before it stops dubbing. To stop the blank recording, press ■ REC STOP.

Program Edit

HDD +RW -RWVR -RWVideo +R -RVR -RVideo

You can select scenes from a DV/Digital8 format tape, and then automatically record selected scenes to the HDD or a DVD.

To use this function, do the following:

Connect your digital video camera and prepare for recording

↓

Select and edit the scenes you want to dub

Using the recorder's remote control, fast forward or rewind the tape to select the scenes. At this point, the selected scenes are not copied to the disc. The recorder only remembers the IN and OUT points of the scenes that you selected for dubbing. You can also erase or change the order of the scenes.

↓

Dub the selected scenes

After you have selected the scenes, the recorder will fast forward and rewind the tape automatically and record the scenes to the HDD or a DVD.

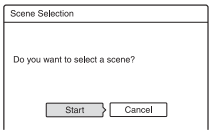
◆How chapters are created

The contents dubbed to the HDD or DVD become a single title. When "Auto Chapter" is set to "On" in the "Recording" setup, this title is divided into chapters. When dubbing to the HDD or a DVD-RW/DVD-R (VR mode), each shooting session on the tape and each selected scene becomes a chapter on the disc. For other discs, the recorder divides the title into chapters at approximately 6 minute intervals.

1 Follow steps 1 to 6 of "Preparing for DV dubbing" on page 91, and press SYSTEM MENU.

2 Select "DV EDIT," and press ENTER.

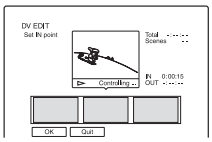
The display asks if you want to start selecting scenes.



- If you have previously saved a program, the display asks if you want to edit an existing program or to create a new program. To resume editing the existing program, select the existing program, and go to step 9.

3 Select "Start," and press ENTER.

The display for setting the IN point (start of the scene) appears.
The scene starts to play.



4 Select the IN point using ◀◀/▶▶, and press ENTER.

Playback pauses.

5 Press ENTER if the IN point is correct.

If the IN point is incorrect, select the IN point using ◀II/II▶, and press ENTER.
The display for setting the OUT point (end of the scene) appears.

6 Select the OUT point using ◀◀/▶▶, and press ENTER.

Playback pauses.

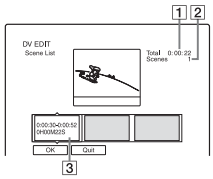
7 Press ENTER if the OUT point is correct.

If the OUT point is incorrect, select the OUT point using ◀II/II▶, and press ENTER.
The selected scene is added to the scene information block.

- To add more scenes, go to step 4.

8 When you finish adding scenes, press ↓.

The scene list is displayed.



1 Total duration of the scene
2 Total number of scenes
3 Scene information block

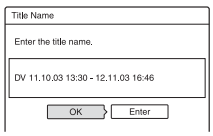
9 Select the scene information block you want to edit using ←/→, and press ENTER.

The sub-menu appears.
"Move": Changes the scene order using ←/→ and ENTER.
"Erase": Erases the scene. When asked for confirmation, select "OK."
"Preview": Plays the selected scene.

- To add more scenes, press ↑ and go to step 4.

10 When you finish editing the scene list, select "OK," and press ENTER.

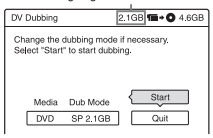
The display for entering the title name appears. To enter a new name, select "Enter," and follow the explanations on page 39.



11 Select "OK," and press ENTER.

The title name is fixed, and the display asks if you want to start recording.
To change the disc media, select "Media" and press ↑/↓. To change the dubbing mode, select "Dub Mode" and press ↑/↓.

Data capacity required for the dubbing. This is displayed in red when the size exceeds the available space on the dubbing target media.



12 Select "Start," and press ENTER.

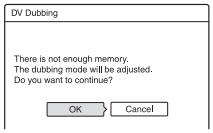
The recorder starts recording the tape contents as programmed.

To stop during recording

Press ■ REC STOP.
Note that it may take a few seconds for the recorder to stop recording.

To automatically adjust the dubbing mode

If there is not enough available space on the target disc, the recorder automatically selects a dubbing mode with lower picture quality according to the available space. The same dubbing mode is set for all of the titles. If disc space is insufficient for the selected dubbing mode, the following display appears after step 12.



Select "OK" and go to step 12.
If you do not want to change the dubbing mode, select "Cancel." However, note that dubbing will end before the title is finished.

Notes

- If you set the beginning of the tape as the IN point and the end point as the OUT point, the IN and OUT points may move slightly during dubbing.
- You cannot set a scene to be shorter than one second.

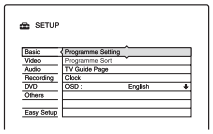
Aerial Reception and Language Settings (Basic)

The “Basic” setup helps you to make tuner, clock, and programme position settings for the recorder.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

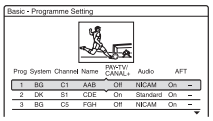
3 Select “Basic,” and press ENTER.
The “Basic” setup appears with the following options. The default settings are underlined.
To turn off the display, press SYSTEM MENU repeatedly.



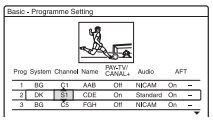
Programme Setting

Presets programme positions manually.
If some programme positions could not be set using the “Easy Setup” function, you can set them manually.
If there is no sound or if the picture is distorted, the wrong tuner system may have been preset during “Easy Setup.” Set the correct tuner system manually in the steps below.

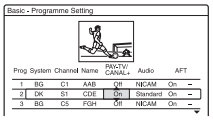
1 Select “Programme Setting” in “Basic,” and press ENTER.


Basic - Programme Setting
Prog System Channel Name PAY-TV/ CANAL+ Audio AFT
1 BG C1 AAB Off NICAM On –
2 DK B1 CDE On Standard On –
3 BG C5 FGH Off NICAM On –

2 Press ↑/↓ to select the programme position, and press ENTER.


Basic - Programme Setting
Prog System Channel Name PAY-TV/ CANAL+ Audio AFT
1 BG C1 AAB Off NICAM On –
2 DK B1 CDE On Standard On –
3 BG C5 FGH Off NICAM On –

3 Select the item you want to change using ←/→, and change the settings using ↑/↓ and press ENTER.


Basic - Programme Setting
Prog System Channel Name PAY-TV/ CANAL+ Audio AFT
1 BG C1 AAB Off NICAM On –
2 DK B1 CDE On Standard On –
3 BG C5 FGH Off NICAM On –

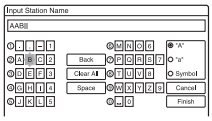
4 To preset another programme position, repeat from step 2.

System
Select an available TV system (page 97).

BG	Select this when in West European countries, except those listed in “Receivable channels” on page 97.
DK	Select this when in East European countries.
I	Select this when in Great Britain/Ireland.
L	Select this when in France.

Channel
Press ↑/↓ repeatedly until the programme position you want is displayed.
The programme positions are scanned in the order shown in the table below.
- If you know the number of the programme position you want, press the number buttons. For example, for programme position 5, first press “0” and then press “5.”
- To disable a programme position, enter “00.” The disabled programme positions will be skipped when you press PROG +/–.
- To select a cable or satellite programme position, press ↑/↓ until the programme position you want is displayed.

Name
Changes or enters a new station name (up to 5 characters). The recorder must receive programme position information (for instance, SMARTLINK information) for station names to appear automatically.



To enter characters, see page 39.

PAY-TV/CANAL+
Sets the PAY-TV/Canal Plus channels.
For details, see page 31.

Audio
Select “NICAM” or “Standard.”

NICAM	Normally, select this.
Standard	Select this if the sound from NICAM broadcasts is not clear.

AFT
Select “On” to turn on AFT.

On	Turns on the Auto Fine Tuning function. Normally, select this.
Off	Allows you to adjust the pictures manually.

- If the Auto Fine Tuning function does not work effectively, select “Off” and press →. Press ↑/↓ to obtain a clearer picture, and press ←.

◆ Receivable channels

TV system	Channel coverage
BG (West European Countries, except those listed below)	E2 – E12 VHF
	Italia A – H VHF
	E21 – E69 UHF
	S1 – S20 CATV
	S21 – S41 HYPER
	S01 – S05 CATV
DK (East European Countries)	R1 – R12 VHF
	R21 – R69 UHF
	S1 – S20 CATV
	S21 – S41 HYPER
	S01 – S05 CATV
I (Great Britain/ Ireland)	Ireland A – J VHF
	South Africa 4 – 13 VHF
	B21 – B69 UHF
	S1 – S20 CATV
	S21 – S41 HYPER
	S01 – S05 CATV
L* (France)	F2 – F10 VHF
	F21 – F69 UHF
	B – Q CATV
	S21 – S41 HYPER

* To receive broadcasts in France, select “L.”

→continued

◆ Tuning the French CATV channels
This recorder can scan the CATV channels B to Q and the HYPER frequency channels S21 to S41. On the Channel Set menu, the channels are indicated as S1 to S44. For example, channel B is indicated by Channel Set number S1, and channel Q is indicated by Channel Set number S23 (see the table below). If the CATV channel you want to preset is indicated by its frequency (for example, 152.75 MHz), refer to the table below to find the corresponding channel number.

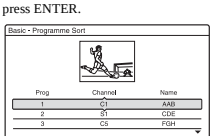
Corresponding channel	Channel Set number	Receivable Frequency range (MHz)
B	S1	116.75–124.75
C	S2	124.75–132.75
D	S3	132.75–140.75
D	S4	140.75–148.75
E	S5	148.75–156.75
F	S6	156.75–164.75
F	S7	164.75–172.75
G	S8	172.75–180.75
H	S9	180.75–188.75
H	S10	188.75–196.75
I	S11	196.75–204.75
J	S12	204.75–212.75
J	S13	212.75–220.75
K	S14	220.75–228.75
L	S15	228.75–236.75
L	S16	236.75–244.75
M	S17	244.75–252.75
N	S18	252.75–260.75
N	S19	260.75–268.75
O	S20	268.75–276.75
P	S21	276.75–284.75
P	S22	284.75–292.75
Q	S23	292.75–300.75
S21	S24	299.25–307.25
S22	S25	307.25–315.25
S23	S26	315.25–323.25
S24	S27	323.25–331.25

Corresponding channel	Channel Set number	Receivable Frequency range (MHz)
S25	S28	331.25–339.25
S26	S29	339.25–347.25
S27	S30	347.25–355.25
S28	S31	355.25–363.25
S29	S32	363.25–371.25
S30	S33	371.25–379.25
S31	S34	379.25–387.25
S32	S35	387.25–395.25
S33	S36	395.25–403.25
S34	S37	403.25–411.25
S35	S38	411.25–419.25
S36	S39	419.25–427.25
S37	S40	427.25–435.25
S38	S41	435.25–443.25
S39	S42	443.25–451.25
S40	S43	451.25–459.25
S41	S44	459.25–467.25

Programme Sort

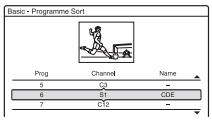
After the programme positions have been set, you can change the order of each programme position in the display list.

1 Select “Programme Sort” in “Basic,” and press ENTER.



2 Press ↑/↓ to select the row containing the programme position you want to move, and press ENTER.
- To display other pages for programme positions 4 to 99, press ↑/↓ repeatedly.

3 Press ↑/↓ until the selected programme position row moves to the desired programme position.
The selected programme position is inserted at the new programme position.



4 Press ENTER to confirm the setting.

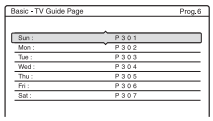
5 To change the programme position of another station, repeat from step 2.

Auto Programme Title Labelling (TV Guide Page)

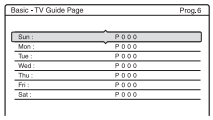
Some broadcast systems provide a Teletext service* in which complete programmes and their data (title, date, programme position, recording start time, etc.) are stored day by day. A TV guide page corresponds to each day of the week. When recording a programme, the recorder automatically takes the programme name from the Teletext pages and stores it as the title name. The TV guide page numbers depend entirely on the broadcast itself and may be subject to change. If so, you may have to set those TV guide page numbers manually in the TV Guide Page menu.
* Not available in some areas.

1 Select “TV Guide Page” in “Basic,” and press ENTER.
The TV Guide Page menu appears.

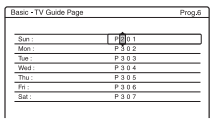
2 Select the programme position for which you want to set or change the TV guide page using PROG +/– or number buttons.
- The TV guide page numbers (Example: P301) appear automatically when the recorder detects them.



- If no page numbers are detected (P000), you have to set the appropriate TV guide page number manually.



3 Select the TV guide page number you want to modify, and press ENTER.



4 Press the number buttons or ←/↑/↓/→ to enter the TV guide page number, and press ENTER to confirm the setting.
- If you make a mistake, re-enter the correct number.
- To return to the original settings, press ↩ RETURN.

5 To set or change another TV guide page number, repeat steps 3 and 4 above.

Hint
To view Teletext information on your TV screen during a broadcast, switch to your TV’s tuner by pressing TV/DVD.

→continued

Notes

- In step 4 above, enter “000” if you do not want to use the TV guide page number for automatic labelling. The recorder will instead store a default title name (programme position, start time - stop time).
- Refer to the Teletext information on your TV screen to obtain the TV guide page number with programme titles and their start times.
- If the Teletext TV guide has a page which always shows the programmes for the current day, this page should be input for all days.
- If you start recording more than three minutes before the programme is scheduled to start, the correct label information may not be transferred.
- Note that this function may not work correctly with programmes broadcast from some stations.
- If the broadcast system updates the Teletext information at the moment recording starts, the title label may not correspond to the recorded programme. In this case, you may have to manually enter the correct title (page 39).

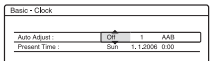
Clock

Auto Adjust (Auto Clock Set)

Turns on the Auto Clock Set function when a programme position in your local area broadcasts a time signal.

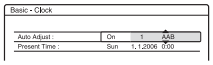
1 Select “Clock” in “Basic,” and press ENTER.

2 Select “Auto Adjust,” and press ENTER.



3 Select “On,” and press ➡.

4 Press ⬆/⬇ repeatedly until the programme position of the station that carries a time signal appears, and press ENTER.



- If the recorder does not receive a time signal from any station, “Auto Adjust” returns to “Off” automatically and the menu for setting the clock manually appears on the screen.

Hint

If you set “Auto Adjust” to “On,” the Auto Clock Set function is activated whenever the recorder is turned off.

Note

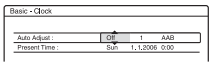
The Auto Clock Set function does not work while the recorder is standing by for Synchro-Recording.

◆To set the clock manually

If the Auto Clock Set function did not set the clock correctly for your local area, try another station for the Auto Clock Set function or set the clock manually.

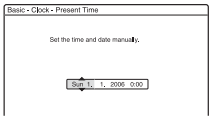
1 Select “Clock” in “Basic,” and press ENTER.

2 Select “Auto Adjust,” and press ENTER.



3 Select “Off,” and press ENTER.

4 Select “Present Time,” and press ENTER.



5 Press ⬆/⬇ to set the day, and press ➡. Set the month, year, hour, and minutes in sequence. Press ⬅/➡ to select the item to be set, then press ⬆/⬇ to set the numbers. The day of the week is set automatically.

To change the numbers, press ⬅ to return to the item to be changed, and press ⬆/⬇.

6 Press ENTER to start the clock.

OSD (On-Screen Display)

Switches the display language on the screen.

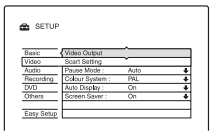
Video Settings (Video)

Video settings will adjust items related to the image, such as size and colour.
Choose the settings according to the type of TV, tuner, or decoder connected to the DVD recorder.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

3 Select “Video,” and press ENTER.
The “Video” setup appears with the following options. The default settings are underlined.

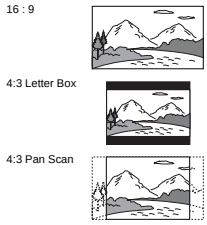


Video Output

◆TV Type

Sets the picture size when playing back a title recorded from 16:9 size video (page 60) or a 16:9 size commercial DVD video.
Select the playback picture size according to the type of connected TV (wide-screen/wide mode TV or conventional 4:3 screen TV).

16 : 9	Select this when connecting to a wide-screen TV or TV with a wide mode function.
4:3 Letter Box	Select this when connecting to a 4:3 screen TV. Displays a wide picture with bands on the upper and lower portions of the screen.
4:3 Pan Scan	Select this when connecting to a 4:3 screen TV. Automatically displays a wide picture on the entire screen and cuts off the portions that do not fit.



Note

Depending on the disc, “4:3 Letter Box” may be selected automatically instead of “4:3 Pan Scan” or vice versa.

◆HDMI Resolution

Selects the type of video signals output from the HDMI OUT jack. When you select “Auto” (default), the recorder outputs video signals of the highest resolution acceptable for your TV. If the picture is not clear, natural or to your satisfaction, try another option that suits the disc and your TV/projector, etc. For details, refer also to the instruction manual supplied with the TV/projector, etc.

Auto	Normally, select this.
1920×1080i	Sends 1920×1080i video signals.
1280×720p	Sends 1280×720p video signals.
720×480/ 576p	Sends 720×480/576p video signals.

Note

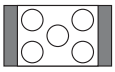
Even when a setting other than “Auto” is selected and the connected TV cannot accept the resolution, the recorder automatically adjusts the video signals that are suitable for the TV.

➡continued

◆4:3 Output

This setting is effective only when you set “TV Type” of “Video Output” to “16 : 9” in the “Video” setup.
Adjust this setting to watch 4:3 aspect ratio signals. If you can change the aspect ratio on your TV, change the setting on your TV, not this recorder.
Note that this setting is effective only for HDMI connection.

Full	Select this when you can change the aspect ratio on your TV.
Normal	Select this when you cannot change the aspect ratio on your TV. Shows a 4:3 size video with the aspect ratio as it is.



16:9 aspect ratio TV

◆Component Out

Selects whether or not to output video signals from the COMPONENT VIDEO OUT jacks.

On	Outputs the component video signals. Select this when you want to view progressive signals.
Off	Outputs no signals.

Notes

- When you set “Line1 Output” of “Scart Setting” to “RGB,” you cannot set “Component Out” to “On.”
- When you connect the recorder to a monitor or projector via only the COMPONENT VIDEO OUT jacks, do not select “Off.” If you select “Off” in this case, the picture may not appear.

◆Progressive Output

If your TV accepts progressive (525p/625p) format signals, set “Progressive Output” to “On.” You will enjoy accurate colour reproduction and high quality images.

1 Select “Progressive Output,” and press ENTER.

2 Select “On,” and press ENTER.
The display asks for confirmation.

3 Select “Start,” and press ENTER.
The video switches to a progressive signal for 5 seconds.

4 If video signal appears OK, select “Yes,” and press ENTER.
If picture is distorted, select “No,” and press ENTER.

◆Progressive Mode

DVD software can be divided into two types: film based software and video based software. Video based software is derived from TV and displays images at 25 frames/50 fields (30 frames/60 fields) per second. Film based software is derived from film and displays images at 24 frames per second. Some DVD software contains both Video and Film.
In order for these images to appear natural on your screen when output in progressive mode (50 or 60 frames per second), the progressive video signal needs to be converted to match the type of DVD software that you are watching.
You can fine-tune the progressive 525p/625p video signal that is output when you set “Progressive Output” to “On.”
Note that you must connect to a progressive format TV using the COMPONENT VIDEO OUT jacks (page 17).

Auto	Automatically detects the software type (Film-based or Video-based) and selects the appropriate conversion mode. Normally select this position.
Video	Fixes the conversion mode to the mode for Video-based software.

Note

When picture noise appears after you set the recorder to progressive format, hold down ■, and press PROGRAM – (minus) on the unit.

Scart Setting

Sets the method of inputting/outputting signals from the SCART jacks on the rear panel of the recorder. Select an option for each of the items below according to the combination of jacks and methods that you are going to use.

◆Line1 Output

Selects a method of outputting video signals for the LINE 1 – TV jack.

RGB	Outputs RGB signals.
Video	Outputs video signals.
S Video	Outputs S-video signals.

Notes

- If your TV does not accept S-video or RGB signals, the image will not be displayed in the selected method on the TV screen even if you select “S Video” or “RGB.” See the instructions supplied with your TV.
- You cannot select “RGB” when “Component Out” above is set to “On.”
- SMARTLINK is available only when “Video” is selected.

◆Line3 Input

Selects a method of inputting video signals for the LINE 3/DECODER jack. The picture will not be clear if this setting does not match the type of video input signal.

Video/ RGB	Inputs video signals or RGB signals.
Decoder	Select this when connecting to a PAY-TV/Canal Plus analogue decoder. If you connect to a cable box/ satellite receiver such as CanalSat, do not select this option.
S Video	Inputs S-video signals.

◆Line3 Output

Selects a method of outputting video signals for the LINE 3/DECODER jack.

Video	Outputs video signals.
S Video	Outputs S-video signals.

Pause Mode (HDD/DVDs only)

Selects the picture quality in pause mode.

Auto	The picture, including subjects that move dynamically, is output with no jitter. Normally select this position.
Frame	The picture, including subjects that do not move dynamically, is output in high resolution.

Colour System

Selects the colour system when playing VIDEO CDs (including Super VIDEO CDs)/ DivX video files.

PAL	Plays a disc in PAL colour system.
NTSC	Plays a disc in NTSC colour system.

Auto Display

On	Automatically displays information on the screen when the recorder is turned on, etc.
Off	Displays information only when DISPLAY is pressed.

Screen Saver

The screen saver image appears when you do not use the recorder for more than 10 minutes while an on-screen display, such as the System Menu, is displayed on your TV screen. The screen saver image helps prevent your display device from becoming damaged (ghosting).

On	Turns on the screen saver function.
Off	Turns off the function.

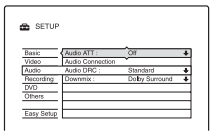
Audio Settings (Audio)

The “Audio” setup allows you to adjust the sound according to the playback and connection conditions.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

3 Select “Audio,” and press ENTER.
The “Audio” setup appears with the following options. The default settings are underlined.



Audio ATT (attenuation)

If the playback sound is distorted, set this item to “On.” The recorder reduces the audio output level.
This function affects the output of the following jacks:
– LINE 2 OUT R-AUDIO-L jacks
– LINE 1 – TV jack
– LINE 3/DECODER jack

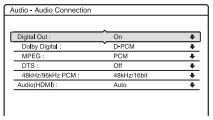
On	Select this when the playback sound from the speakers is distorted.
Off	Normally select this position.

Audio Connection

The following setup items switch the method of outputting audio signals when you connect a component such as an amplifier (receiver) with a digital input jack.
For connection details, see “Step 3: Connecting the Audio Cords” on page 20.
Select “Dolby Digital,” “MPEG,” “DTS,” “48kHz/96kHz PCM,” and “Audio(HDMI)” after setting “Digital Out” to “On.”

If you connect a component that does not accept the selected audio signal, a loud noise (or no sound) will come out from the speakers, and may affect your ears or cause speaker damage.

1 Select “Audio Connection” in “Audio,” and press ENTER.



2 Select “Digital Out,” and press ENTER.

On	Normally select this position.
Off	The influence of the digital circuit upon the analogue circuit is minimal.

3 Select “On,” and press ENTER.

4 Set the digital output signal.

• Dolby Digital (HDD/DVDs only)
Selects the type of Dolby Digital signal.

D-PCM	Select this when the recorder is connected to an audio component lacking a built-in Dolby Digital decoder. The surround effects of output signals are determined by the “Downmix” setting item in the “Audio” setup.
Dolby Digital	Select this when the recorder is connected to an audio component with a built-in Dolby Digital decoder.

Note
If the HDMI OUT jack is connected to equipment not compatible with DOLBY DIGITAL signals, the “D-PCM” signals will be automatically output even when you select “Dolby Digital.”

• MPEG (DVD VIDEOs only)
Selects the type of MPEG audio signal.

PCM	Select this when the recorder is connected to an audio component without a built-in MPEG decoder. If you play MPEG audio sound tracks, the recorder outputs stereo signals via the DIGITAL OUT (COAXIAL or OPTICAL) jack.
MPEG	Select this when the recorder is connected to an audio component with a built-in MPEG decoder.

Note
If the HDMI OUT jack is connected to equipment not compatible with MPEG audio signals, the “PCM” signals will be automatically output even when you select “MPEG.”

• DTS (DVD VIDEOs only)
Selects whether or not to output DTS signals.

On	Select this when the recorder is connected to an audio component with a built-in DTS decoder.
Off	Select this when the recorder is connected to an audio component without a built-in DTS decoder.

Note
When HDMI output is performed to equipment not compatible with DTS signals, the signals will not be output regardless of the “DTS” setting.

• 48kHz/96kHz PCM (DVD VIDEOs only)
Selects the sampling frequency of the audio signal.

48kHz/16bit	The audio signals of DVD VIDEOs are converted to 48 kHz/16 bit and output.
96kHz/24bit	All signals containing 96 kHz/24 bit are output without conversion. However, the signals are output at 48 kHz/16 bit if copyright-protected signals are contained.

Notes
- “48kHz/96kHz PCM” setting has no effect when audio signals are output from the LINE 2 OUT (R-AUDIO-L) jacks or LINE 1 – TV/LINE 3/DECODER jack. If the sampling frequency is 96 kHz, signals are simply converted to analogue signals and output.
- If the HDMI OUT jack is connected to equipment not compatible with 96 kHz signals, 48 kHz PCM will be automatically output even when you select “96kHz/24bit.”

• Audio(HDMI)
Selects the type of audio signal output from the HDMI OUT jack.

Auto	Normally, select this position. Outputs the optimum audio signal that can be received by the TV based on the “Digital Out” setting (page 104).
PCM	Converts Dolby Digital or 96 kHz PCM signals to 48 kHz/16 bit PCM.

Notes
- A loud noise (or no sound) will be output if you connect the recorder to a TV that is not compatible with DOLBY DIGITAL/DTS signals and “Auto” is selected. In this case, select “PCM.”
- Set “Digital Out” to “On” when outputting compressed audio signals to an HDMI compatible TV.

➞continued

Audio DRC (Dynamic Range Control) (DVDs only)

Selects the dynamic range (difference between soft and loud sounds) setting when playing a DVD that conforms to “Audio DRC.” This affects the output from the following jacks:
– LINE 2 OUT R-AUDIO-L jacks
– LINE 1 – TV jack
– LINE 3/DECODER jack
– DIGITAL OUT (COAXIAL or OPTICAL)/HDMI OUT jack only when “Dolby Digital” is set to “D-PCM” (page 104).

Standard	Normally select this position.
TV Mode	Makes low sounds clear even if you turn the volume down.
Wide Range	Gives you the feeling of being at a live performance.

Downmix (DVDs only)

Switches the method for mixing down to two channels when you play a DVD which has rear sound elements (channels) or is recorded in Dolby Digital format. For details on the rear signal components, see “4. Displaying the Playing Time and Play Information” on page 37. This function affects the output of the following jacks:
– LINE 2 OUT R-AUDIO-L jacks
– LINE 1 – TV jack
– LINE 3/DECODER jack
– DIGITAL OUT (COAXIAL or OPTICAL)/HDMI OUT jack when “Dolby Digital” is set to “D-PCM” (page 104).

Dolby Surround	Normally select this position. Multi-channel audio signals are output to two channels for enjoying surround sounds.
Normal	Multi-channel audio signals are downmixed to two channels for use with your stereo.

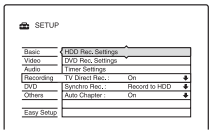
Recording Settings (Recording)

The “Recording” setup allows you to adjust recording settings.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

3 Select “Recording,” and press ENTER.
The “Recording” setup appears with the following options. The default settings are underlined.



HDD Rec. Settings

◆Bilingual Recording
Selects the sound to be recorded on the HDD.

Main	Records the main sound for the bilingual programme.
Sub	Records the sub sound for the bilingual programme.
Main+Sub	Records the main and sub sounds for the bilingual programme.

Note
If you change the recording mode while dubbing from a DVD to the HDD, the sound recorded in the source (DVD) is applied regardless of this setting.

◆HQ Setting
Selects the HQ mode used for recording on the HDD (page 54).

HQ+	Records in higher quality (approximate 15 Mbps).
HQ	Records in the standard HQ mode.

DVD Rec. Settings

◆Bilingual Recording (for all recordable discs except DVD-RWs/DVD-Rs in VR mode)
Selects the sound to be recorded on the recordable disc. This setting is not necessary when recording on DVD-RWs/DVD-Rs (VR mode) that record both the main and sub sounds.

Main	Records the main sound for the bilingual programme.
Sub	Records the sub sound for the bilingual programme.

Timer Settings

◆Rec. Mode Adjust

On	Automatically adjusts the recording mode to enable the entire programme to be recorded (page 57).
Off	Turns off the function.

◆Auto Title Erase (HDD only)

On	Automatically erases old titles recorded on the HDD (page 57).
Off	Turns off the function.

TV Direct Rec. (HDD/DVD+RW/DVD-RW/DVD+R/DVD-R only)

Selects whether to directly start recording using the SMARTLINK feature (page 34). This setting is effective only when you connect the recorder to your TV via the SCART jacks.

On	Allows you to easily record what you are watching on the TV.
Off	Turns off the TV Direct Rec function.

Synchro Rec.

Selects the recording destination used for Synchro-Recording (page 63).

Record to HDD	Records to the HDD.
Record to DVD	Records to DVDs.

Auto Chapter

Selects whether to automatically divide a recording (a title) into chapters during recording or dubbing.

On	Inserts chapter marks at approximately 6 minute intervals.
Off	No chapter mark is inserted.

Notes
- The actual chapter mark interval may vary depending on the amount of information contained in the video to be recorded.
- Chapter marks are automatically inserted where the recordings start on the tape when “Auto Chapter” is set to “On” during DV dubbing to the HDD or a DVD-RW/DVD-R (VR mode).

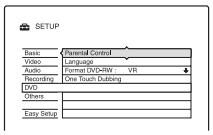
Disc Settings (DVD)

The “DVD” setup allows you to adjust parental control, language and other DVD related settings.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

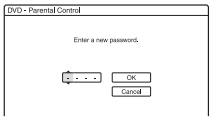
3 Select “DVD,” and press ENTER.
The “DVD” setup appears with the following options. The default settings are underlined.



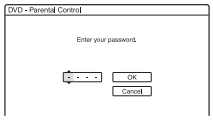
Parental Control (DVD VIDEO only)

Playback of some DVD VIDEOs can be limited according to a predetermined level, such as the age of the users. Scenes may be blocked or replaced with different scenes.

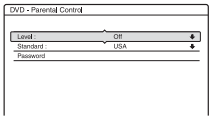
1 Select “Parental Control” in “DVD,” and press ENTER.
- If you have not entered a password, the display for registering a new password appears.



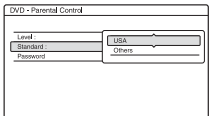
- When you have already registered a password, the display for entering the password appears.



2 Enter your four-digit password using the number buttons, then select “OK” and press ENTER.

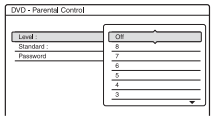


3 Select “Standard,” and press ENTER.
The selection items for “Standard” are displayed.



4 Select a geographic area as the playback limitation level, and press ENTER.
The area is selected.
- When you select “Others,” press the number buttons to select and enter an area code in the table (page 127). Then select “OK” and press ENTER.

5 Select “Level,” and press ENTER.
The selection items for “Level” are displayed.



The lower the value, the stricter the limitation.
Discs rated higher than the selected level will be restricted.

6 Select the level, and press ENTER.
The Parental Control setting is complete.

To cancel the Parental Control setting for the disc, set “Level” to “Off” in step 6.
To change the password, select “Password” in step 3, and press ENTER. When the display for registering a password appears, enter a new four-digit password using the number buttons, then select “OK” and press ENTER.

Notes
- If you forget your password, you will have to reset it by selecting “Parental Control” of “Factory Setup” in the “Others” setup (page 110).
- When you play discs which do not have the Parental Control function, playback cannot be limited on this recorder.
- Depending on the disc, you may be asked to change the Parental Control level while playing the disc. In this case, enter your password, then change the level.

Language (DVD VIDEO only)

◆DVD Menu
Switches the language for the DVD menu.

◆Audio
Switches the language of the sound track.
When you select “Original,” the language given priority in the disc is selected.

◆Subtitle
Switches the language of the subtitles recorded on the disc.
When you select “Audio Follow,” the subtitle language changes according to the language you selected for the sound track.

Hint
If you select “Others” in “DVD Menu,” “Subtitle,” or “Audio,” select and enter a language code from “Language Code List” on page 127 using the number buttons.

Note
If you select a language in “DVD Menu,” “Subtitle,” or “Audio” that is not recorded on the DVD VIDEO, one of the recorded languages will be automatically selected.

Format DVD-RW (DVD-RW only)

The recorder automatically starts formatting in VR mode or Video mode, whichever is selected below, when a new, unformatted DVD-RW is inserted.

VR	Automatically formats the disc in VR mode.
Video	Automatically formats the disc in Video mode.

One Touch Dubbing

Displays the following options for the One Touch Dub function.

◆Finalise Disc (for all recordable discs except DVD-RW in VR mode)
Selects whether or not to finalise the disc automatically following One Touch Dubbing (page 93).

Auto	Automatically finalises the disc following One Touch Dubbing.
Manual	Allows you to finalise the disc manually.

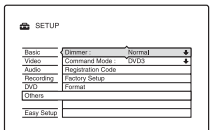
Remote Control Settings/ Factory Settings (Others)

The “Others” setup allows you to set up other operational settings.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

3 Select “Others,” and press ENTER.
The “Others” setup appears with the following options. The default settings are underlined.



Dimmer

Adjusts the lighting of the front panel display.

Normal	Bright lighting.
Save Power	Low lighting. Turns off the lighting when the power is off.

Command Mode

Changes the Command Mode of the recorder if other DVD equipment is assigned the same Command Mode. For details, see “If you have a Sony DVD player or more than one Sony DVD recorder” on page 23.

Registration Code

Displays the registration code of DivX video files for this recorder.
For more information, go to http://www.divx.com/vod on the Internet.

Factory Setup

Allows you to select the setup settings by group, and return them to their default settings. Note that all of your previous settings will be lost.

1 Select “Factory Setup” in “Others,” and press → or ENTER.
The display for selecting a group of settings appears.

2 Select the group of settings you want to return to default from “Basic,” “Video,” “Audio,” “Recording,” “DVD,” “Others,” “Parental Control,” and “All,” and press → or ENTER.

3 Select “Start,” and press ENTER.
The selected settings return to their default settings.

4 Press ENTER when “Finish” appears.

Format

You can erase all titles recorded on the HDD.

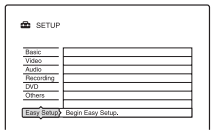
Easy Setup (Resetting the Recorder)

Select this to run the “Easy Setup” programme.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

3 Select “Easy Setup,” and press ENTER.



4 Select “Start.”

5 Follow the instructions for “Easy Setup” (page 25) from step 2.

Troubleshooting

If you experience any of the following difficulties while using the recorder, use this troubleshooting guide to help remedy the problem before requesting repairs. Should any problem persist, consult your nearest Sony dealer.

Power

The power does not turn on.

➡ Check that the mains lead is connected securely.

Picture

There is no picture.

➡ Re-connect all connecting cords securely.
➡ The connecting cords are damaged.
➡ Check the connection to your TV (page 13).
➡ Switch the input selector on your TV (such as to "VCR") so that the signal from the recorder appears on the TV screen.
➡ Check that "Scart Setting" in the "Video" setup is set to the appropriate item that conforms to your system (page 103).
➡ If you connect the recorder to your TV via only the COMPONENT VIDEO OUT jacks, set "Component Out" of "Video Output" in the "Video" setup to "On" (page 102).
➡ This recorder cannot record NTSC signals.
➡ When playing a double-layer DVD, the video and audio may be momentarily interrupted at the point where the layers switch.

Picture noise appears.

➡ If the picture output signal from your recorder passes through your VCR to get to your TV, or if you are connected to a combination TV/VIDEO player, the copy-protection signal applied to some DVD programmes could affect picture quality. If you still experience this problem even when you connect your recorder directly to your TV, try connecting your recorder to your TV's S VIDEO input.
➡ You have set the recorder to progressive format even though your TV cannot accept the progressive signal. In this case, hold down ■, and press PROGRAM – (minus) on the unit.
➡ Even if your TV is compatible with progressive format (525p/625p) signals, the image may be affected when you set the recorder to progressive format. In this case, hold down ■, and press PROGRAM – (minus) on the unit and the recorder is set to normal (interlace) format.
➡ You are playing a DVD recorded in a colour system that is different from your TV.
➡ Noise may appear in the pictures recorded on the HDD, which is due to the characteristics of HDD, and is not a malfunction.
➡ When playing a double-layer DVD, the video and audio may be momentarily interrupted at the point where the layers switch.

There is no picture or the picture noise appears when connected to the DV IN jack.

➡ Try the following: ①Turn the recorder off and on again. ②Turn the connected equipment off and on again. ③Disconnect and then connect the i.LINK cable again.

There is no picture or the picture noise appears when connected to the HDMI OUT jack.

➡ Try the following: ①Turn the recorder off and on again. ②Turn the connected equipment off and on again. ③Disconnect and then connect the HDMI cord again.
➡ If the HDMI OUT jack is used for video output, changing the "HDMI Resolution" setting of "Video Output" in the "Video" setup may solve the problem (page 101). Connect the TV and the recorder using a video jack other than the HDMI OUT, and switch the TV's input to the connected video input so that you can see the on-screen displays. Change the "HDMI Resolution" setting of "Video Output" in the "Video" setup, and switch the TV's input back to HDMI. If the picture still does not appear, repeat the steps and try other options.
➡ The recorder is connected to an input device that is not HDCP compliant (page 17).
➡ Depending on the setting combination for "TV Type" and "4:3 Output," the edge of the screen may be hidden or displayed with black bands, or the left and right sides of the image may flicker. In this case, change the settings on your TV, not on this recorder.

Depending on the connected equipment, the video signals of the selected HDMI resolution may not be output.

➡ When connecting the DVI equipment, 720×480/576p video signals are output even when an option other than 720×480/576p is selected.
➡ When connecting the DVI equipment and a PC monitor that is HDCP compliant, only 720×480/576p video signals may be output.

TV programme reception does not fill the screen.

➡ Set the channel manually in "Programme Setting" in the "Basic" setup (page 96).
➡ Select the correct source using the INPUT SELECT button, or select a channel of any TV programme using the PROG +/– buttons.

TV programme pictures are distorted.

➡ Reorient the TV aerial.
➡ Adjust the picture (see the TV's instruction manual).
➡ Place the recorder and TV farther apart.
➡ Place the TV and any bunched aerial cables farther apart.
➡ The aerial cable is connected to the AERIAL OUT jack on the recorder. Connect the cable to the AERIAL IN jack.

TV channels cannot be changed.

➡ The channel is disabled (page 97).
➡ A timer recording started, which changed the channels.

The picture from equipment connected to the recorder's input jack does not appear on the screen.

➡ If the equipment is connected to the LINE 1 – TV jack, select "L1" in the front panel display by pressing PROG +/– or INPUT SELECT.
If the equipment is connected to the LINE 2 IN jacks, select "L2" in the front panel display by pressing PROG +/– or INPUT SELECT.
If the equipment is connected to the LINE 3/DECODER jack, select "L3" in the front panel display by pressing PROG +/– or INPUT SELECT.
If the equipment is connected to the DV IN jack, (this is usually for a digital video camera connection), select "DV" in the front panel display by pressing INPUT SELECT.

The playback picture or TV programme from the equipment connected through the recorder is distorted.

➡ If the playback picture output from a DVD player, VCR, or tuner goes through your recorder before reaching your TV, the copy-protection signal applied to some programmes could affect picture quality. Disconnect the playback equipment in question and connect it directly to your TV.

The picture does not fill the screen.

➡ Set "TV Type" of the "Video Output" in the "Video" setup in accordance with the screen size of your TV (page 101).

➡continued

The picture does not fill the screen, even though the picture size is set in "TV Type" of the "Video Output" in the "Video" setup.

➡ The picture size of the title is fixed.

The picture is black and white.

➡ Check that "Line1 Output" of the "Scart Setting" in the "Video" setup is set to the appropriate item that conforms to your system (page 103).
➡ If you are using a SCART cord, be sure to use one that is fully wired (21 pins).

GUIDE Plus+ system

GUIDE Plus+ system does not appear.

➡ ①Even if you complete "Easy Setup," TV programme listings do not appear until the recorder receives the GUIDE Plus+ data. ②Turn off the recorder, but do not unplug it. ③Wait for 24 hours. It may take several days for the recorder to receive the GUIDE Plus+ data for all programme positions. If the recorder does not receive the GUIDE Plus+ data after 24 hours, set the host channel manually (page 52).
➡ The country/region or postal code is incorrect. Correctly set your country/region and postal code (page 50).
➡ The host channel setup for your set top box receiver is incorrect.
Set the host channel manually (page 52).
➡ When the recorder is connected to a set top box receiver, the set top box receiver must be turned on to download the GUIDE Plus+ data.
➡ Area numbers that cannot be received using GUIDE Plus+ are set. Select "Easy Setup" from "SETUP" in the System Menu, and follow the on-screen instructions to make the settings again (page 25).
➡ The "Time Lock" function on your cable box is activated. Set this function to off.
➡ If the host channel has changed or moved, the programme guide data cannot be received. In this case, follow the steps in "Searching for the GUIDE Plus+ host channel" (page 51) to update the host channel setting. If the problem still persists after waiting for a day, search for the host channel at the following website and set the host channel manually (page 52).
www.europe.guideplus.com

The programme position number in the programme listing does not match the broadcast station.

➡ There may be more than one channel lineup for your area. To change the channel lineup, select "Editor" in the Menu Bar of the GUIDE Plus+ system (page 52).

Programme listings for some programme positions are missing.

➡ The programme guide data may not be updated. Turn off the recorder and let the recorder receive the programme guide data.
➡ Some broadcast stations support only two days of data. For details, see the following website:
www.europe.guideplus.com
➡ All of the GUIDE Plus+ data could not be received because the reception is poor.

The programme listing is not up to date.

➡ The recorder was in use during the time that the GUIDE Plus+ data was scheduled to be downloaded.
➡ All of the GUIDE Plus+ data could not be received because the reception is poor.

Sound

There is no sound.

➡ Re-connect all connections securely.
➡ The connecting cord is damaged.
➡ The input source setting on the amplifier or the connection to the amplifier is incorrect.
➡ The recorder is in reverse play, fast-forward, slow motion, or pause mode.
➡ If the audio signal does not come through the DIGITAL OUT (COAXIAL or OPTICAL)/HDMI OUT jacks, check the "Audio Connection" settings in the "Audio" setup (page 104).
➡ The recorder supports only MP3 audio and MPEG audio for DivX video files. Press AUDIO and select MP3 audio or MPEG audio.

No sound is output from the HDMI OUT jack.

➡ Try the following: ①Turn the recorder off and on again. ②Turn the connected equipment off and on again. ③Disconnect and then connect the HDMI cord again.
➡ The HDMI OUT jack is connected to a DVI device (DVI jacks do not accept audio signals).
➡ The equipment connected to the HDMI OUT jack does not conform to the audio signal format, in this case set "Audio(HDMI)" of "Audio Connection" to "PCM" in the "Audio" setup (page 105).

Sound distortion occurs.

➡ Set "Audio ATT" in the "Audio" setup to "On" (page 104).

Sound is noisy.

➡ When playing a CD with DTS sound tracks, noise will come from the LINE 2 OUT R-AUDIO-L jacks, LINE 1 – TV jack, or LINE 3/DECODER jack (page 69).

The sound volume is low.

➡ The sound volume is low on some DVDs. The sound volume may improve if you set "Audio DRC" in the "Audio" setup to "TV Mode" (page 106).
➡ Set "Audio ATT" in the "Audio" setup to "Off" (page 104).

An alternate audio track cannot be recorded or played.

➡ When recording from connected equipment, set "Line Audio Input" in OPTIONS menu to "Bilingual" (page 65).
➡ Multilingual tracks (main and sub) cannot be recorded on DVD+RWs, DVD-RWs (Video mode), DVD+Rs, or DVD-Rs (Video mode). To record the language, set "Bilingual Recording" of the "DVD Rec. Settings" in the "Recording" setup to "Main" or "Sub" before recording (page 107). To record both the main and sub sounds, record on DVD-RWs/DVD-Rs (VR mode).
➡ Any discs other than the HDD or DVD-RWs/DVD-Rs (VR mode) cannot be used for recording both main and sub sounds. To record on the HDD, set "Bilingual Recording" of the "HDD Rec. Settings" in the "Recording" setup to "Main+Sub" (page 106).
➡ If you have connected an AV amplifier to the DIGITAL OUT (COAXIAL or OPTICAL) jack and want to change the audio track for HDD/DVD-RWs/DVD-Rs (VR mode) during playback, set "Dolby Digital" of the "Audio Connection" in the "Audio" setup to "D-PCM" (page 104).

Playback

The recorder does not play any type of disc (except HDD).

➡ The disc is upside down. Insert the disc with the labelled side facing up.
➡ The disc is not correctly inserted.
➡ Moisture has condensed inside the recorder. In this case, if the recorder is on, leave it on (if it is off, leave it off) for about an hour until the moisture evaporates.
➡ If the disc was recorded on another recorder and was not finalised (page 41), the recorder cannot play the disc.

The recorder does not start playback from the beginning.

➡ Resume play was activated (page 67).
➡ You have inserted a DVD whose Title menu or DVD menu automatically appears on the TV screen when it is first inserted. Use the menu to start playback.

The recorder starts playing automatically.

➡ The DVD VIDEO features an auto playback function.

Playback stops automatically.

➡ If the DVD has an auto pause signal, the recorder stops playback at the auto pause signal.

➡continued

Some functions such as Stop, Search, or Slow-motion Play cannot be performed.
➡ Depending on the DVD, you may not be able to do some of the operations above. See the instruction manual supplied with the disc.

The language for the sound track cannot be changed.
➡ Multilingual tracks are not recorded on the DVD being played.
➡ The DVD VIDEO prohibits the changing of the language for the sound track.
➡ Try changing the language using the DVD VIDEO's menu.

The subtitle language cannot be changed or turned off.
➡ Multilingual subtitles are not recorded on the DVD VIDEO.
➡ The DVD VIDEO prohibits changing of the subtitles.
➡ Try changing the subtitle using the DVD VIDEO's menu.
➡ The subtitles cannot be changed for the titles recorded on this recorder.

The angles cannot be changed.
➡ Multi-angles are not recorded on the DVD VIDEO being played.
➡ You are trying to change the angles when "" does not appear in the front panel display (page 66).
➡ The DVD VIDEO prohibits changing angles.
➡ Try changing the angle using the DVD VIDEO's menu.
➡ The angles cannot be changed for the titles recorded on this recorder.
➡ The angles cannot be changed during slow motion playback or when playback is paused.

The DivX video files do not play.
➡ The file is not created in DivX format.
➡ The file has an extension other than ".avi" or ".divx."
➡ The DATA CD (DivX video)/DATA DVD (DivX video) is not created in a DivX format that conforms to ISO9660 Level 1/ Level 2 or Joliet.
➡ The DivX video file is larger than 720 (width) × 576 (height).

The MP3 audio tracks do not play.
➡ The MP3 audio tracks are not recorded in a format that the recorder can play (page 73).

The JPEG image files do not play.
➡ The JPEG image files are not recorded in a format that the recorder can play (page 73).
➡ Progressive JPEG images cannot be played.

TV Pause does not work.
➡ You are recording to the HDD or the HDD is full.

Recording/Timer recording/ Editing

The programme position cannot be changed from the programme position you are recording.
➡ Set the TV's input source to "TV."

Recording does not start immediately after you press ● REC.
➡ Operate the recorder only after "LOAD," "FORMAT," or "INFOWRITE" disappears from the front panel display.

Nothing was recorded even though you set the timer setting correctly.
➡ There was a power failure during recording.
➡ The recorder's internal clock stopped due to a power failure that lasted for more than 1 hour. Reset the clock (page 100).
➡ The channel was disabled after the timer recording was set. See "Programme Setting" on page 96.
➡ The programme position was hidden after the timer recording was set. (See "Making changes to the GUIDE Plus+ System" on page 50.)
➡ Disconnect the mains lead from the mains, and connect it again.
➡ "PDC/VPS Scan Off" was selected in the OPTIONS menu (page 62).
➡ The programme contains copy protection signals that restrict copying.
➡ Other timer setting overlapped the timer setting (page 63).

➡ There is no DVD inside the recorder.
➡ There is not enough disc space for the recording.
➡ The set top box was turned off.
➡ The set top box controller was incorrectly connected (page 13).
➡ The settings in "Setup" in the Menu bar have been changed (page 50).
➡ The recorder was in the process of dubbing (HDD↔DVD).
➡ The recorder was in the process of DV Dubbing.

Recording does not stop immediately after you press ■ REC STOP.
➡ It will take a few seconds for the recorder to input disc data before recording can stop.

Recording does not stop after you press ■.
➡ Press ■ REC STOP.

Timer recording is not complete or did not start from the beginning.
➡ There was a power failure during recording. If the power recovers when there is a timer recording, the recorder resumes recording. Should the power failure continue for more than 1 hour, reset the clock (page 100).
➡ Other timer setting overlapped the timer setting (page 63).
➡ Disc space was not enough.
➡ The PDC/VPS function is working.

Contents previously recorded were erased.
➡ Data that is not playable on this recorder but was recorded on a DVD with a PC will be erased from the disc when the disc is inserted.
➡ "Auto Title Erase" of the "Timer Settings" in the "Recording" setup is set to "On" (page 107).

The PDC/VPS function does not operate.
➡ Check that the clock and date are set correctly.
➡ Check that the PDC/VPS time you set is the correct one (there might be a mistake in the TV programme guide). If the broadcast you wanted to record did not send the good PDC/VPS information, the recorder will not start recording.
➡ If the reception is poor, the PDC/VPS signal might be altered and the recorder might not start recording.
➡ "PDC/VPS Scan Off" is selected (page 62).
➡ The PDC/VPS function may not work if the GUIDE Plus+ host channel setup is not complete.
➡ The PDC/VPS function does not work when the GUIDE Plus+ data is being downloaded.

Recording from the equipment with a timer

Nothing was recorded even though you set the Synchro-Rec setting correctly.
➡ You forgot to turn off the connected equipment. Turn off the connected equipment and set the recorder to Synchro-Rec standby mode (page 63).
➡ The recorder was not set to the Synchro-Recording standby mode. Press → ● SYNCHRO REC to have the recorder stand by for recording. Make sure the SYNCHRO REC indicator lights up on the front panel (page 63).
➡ The equipment is not connected to the LINE 3/DECODER jack of the recorder.
➡ The recorder is connected to the TV output jack of the connected equipment.

Synchro-Recording does not complete.
➡ The timer setting for the connected equipment overlapped the recorder's timer setting (page 64).
➡ There was a power failure during the recording.

Additional Information

➡continued

The recorder automatically starts recording when the satellite receiver is turned on.
➡ The Synchro-Rec function was activated. Turn off the satellite receiver and cancel the Synchro-Rec function (page 63).

Dubbing

You dubbed a title, but the title did not appear in the HDD Title List.
➡ The title contained a copy protection signal, so it was moved (page 87).

High-speed dubbing is not possible.
➡ The title cannot be dubbed at high-speed (page 86). Even if A-B erasure is performed so that a title does not contain mixed picture sizes, it is still treated as a title with mixed picture sizes.

Display

The clock has stopped.
➡ Set the clock again (page 100).
➡ The clock stopped due to a power failure that lasted for more than 1 hour. Reset the clock (page 100).

The TIMER REC indicator is flashing.
➡ The disc does not have enough space.
➡ Insert a recordable disc inside the recorder.
➡ The inserted DVD is protected (page 41).

The recording mode indication is incorrect.
➡ When the recording or dubbing is less than ten minutes, or if a picture with little movement is displayed for more than ten minutes, the recording mode indication may be displayed incorrectly. Note that the actual recording or dubbing itself was correctly made in the selected recording mode.
➡ After playing titles recorded in EP and SLP mode, the recording mode indication may change depending on the recorded programme.

The clock does not appear in the front panel display when the recorder is turned off.
➡ "Dimmer" in the "Others" setup is set to "Save Power" (page 110).

Remote control

The remote does not function.
➡ Batteries are weak.
➡ The remote is too far from the recorder.
➡ The remote's manufacturer code returned to the default setting when you replaced the batteries. Reset the code (page 22).
➡ The remote is not pointed at the remote sensor on the recorder.
➡ Different command modes are set for the recorder and remote. Set the same command mode (page 23). The default command mode setting for this recorder and the supplied remote is DVD3.
➡ Press ■ (stop) on the unit while the recorder is turned off to check the current command mode.

Others

The recorder does not operate properly.
➡ Restart the recorder. Press down I/⏻ on the recorder for more than ten seconds until "WELCOME" appears in the front panel display.
➡ When static electricity, etc., causes the recorder to operate abnormally, turn off the recorder and wait until the clock appears in the front panel display. Then, unplug the recorder and after leaving it off for a while, plug it in again.

Five numbers or letters are displayed in the front panel display.
➡ The self-diagnosis function was activated (see the table on page 120).

The disc tray does not open after you press ⏏ (open/close).
➡ It may take a few seconds for the disc tray to open after you have recorded or edited a DVD. This is because the recorder is adding disc data to the disc.

The disc tray does not open and "LOCKED" appears in the front panel display.
➡ The disc tray is locked. Cancel the Child Lock (page 67).

The disc tray does not open and "TRAY LOCKED" appears in the front panel display.
➡ Contact your Sony dealer or local authorized Sony service facility.

The disc tray does not open and you cannot remove the disc after you press ⏏ (open/close).
➡ Turn off the recorder. Once the clock appears in the front panel display, disconnect the mains lead. (If the recorder does not turn off or if the clock does not appear in the front panel display, disconnect the mains lead anyway.) Connect the mains lead again while pressing down ⏏ on the recorder, and release the button when the disc tray opens. Then, keep I/⏻ on the recorder pressed for about ten seconds until "WELCOME" appears in the front panel display.

"RECOVERY" appears in the front panel display.
➡ The recorder's recovery function was activated when the recorder was turned on because the power was turned off or failed during recording. Leave the recorder on until "RECOVERY" disappears from the front panel display.

"HDD ERROR" appears in the front panel display.
➡ The hard disk error occurred. Press down I/⏻ on the recorder for ten seconds until "WELCOME" appears in the front panel display. If this does not resolve the problem, format the recorder's HDD by pressing down the HDD button on the recorder for more than ten seconds until "FORMAT" appears in the front panel display. Note that all the contents recorded on the HDD will be erased. If this does not fix the problem, contact your nearest Sony dealer.

"FAN ERROR" appears in the front panel display.
➡ Check that the vent on the rear of the recorder is not blocked. Then, immediately disconnect the mains lead. Leave the recorder off for a while, then re-connect the mains lead, and press I/⏻ on the recorder.

Mechanical sound is heard when the recorder is off.
➡ While the recorder is adjusting the clock for the Auto Clock Set function, scanning the programme positions for the PDC/VPS function or updating the EPG information, operational noises (such as the internal fan) may be heard, even when the power is off. This is not a malfunction.

Additional Information

Self-diagnosis Function (When letters/numbers appear in the display)

When the self-diagnosis function is activated to prevent the recorder from malfunctioning, a five-character service number (e.g., C 13 00) with a combination of a letter and four numbers appears in the front panel display. In this case, check the following table.

First three characters of the service number	Cause and/or corrective action
C 13	There is a problem in the HDD. ➡ Contact your nearest Sony dealer or local authorized service facility. The DVD is dirty. ➡ Clean the disc with a soft cloth.
C 31	The DVD/CD is not inserted correctly. ➡ Re-insert the disc correctly.
E XX (xx is a number)	To prevent a malfunction, the recorder has performed the self-diagnosis function. ➡ Contact your nearest Sony dealer or local authorized Sony service facility and give the five-character service number. Example: E 61 10

Notes About This Recorder

On operation

- If the recorder is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lenses inside the recorder. Should this occur, the recorder may not operate properly. In this case, if the recorder is on, leave it on (if it is off, leave it off) for about an hour until the moisture evaporates.
- When you move the recorder, take out any discs and do not apply shock or vibration to the hard disk drive. If you don't, the disc or hard disk drive may be damaged (page 3).

On adjusting volume

Do not turn up the volume while listening to a section with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level section is played.

On cleaning

Clean the cabinet, panel, and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

On cleaning discs, disc/lens cleaners

Do not use cleaning discs or disc/lens cleaners (including wet or spray types). These may cause the recorder to malfunction.

Notes about the discs

- To keep the disc clean, handle the disc by its edge. Do not touch the surface. Dust, fingerprints, or scratches on the disc may cause it to malfunction.

- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as the temperature may rise considerably inside the car.
- After playing, store the disc in its case.
- Clean the disc with a cleaning cloth. Wipe the disc from the centre out.

- Do not use solvents such as benzine, thinner, commercially available cleaners, or anti-static spray intended for vinyl LPs.
- Do not use the following discs.
  - A disc that has a non-standard shape (e.g., card, heart).
  - A disc with a label or sticker on it.
  - A disc that has cellophane tape or sticker adhesive on it.

On replacement of parts

In the event that this unit is repaired, repaired parts may be collected for reuse or recycling purposes.

Specifications

System

Laser: Semiconductor laser
Channel coverage:
PAL/SECAM (B/G, D/K, I, L)
VHF: E2 to E12, R1 to R12, F2 to F10, Italian A to H, Ireland A to J, South Africa 4 to 13
UHF: E21 to E69, R21 to R69, B21 to B69, F21 to F69
CATV: S01 to S05, S1 to S20, France B to Q
HYPER: S21 to S41

The above channel coverage merely ensures the channel reception within these ranges. It does not guarantee the ability to receive signals in all circumstances. For details, see "Receivable channels" (page 97).

Video reception: Frequency synthesizer system
Audio reception: Split carrier system
Aerial out: 75-ohm asymmetrical aerial socket
Timer: Clock: Quartz locked/Timer indication: 24-hour cycle (digital)/Power back-up duration: 1 hour
Video recording format: MPEG-2, MPEG-1
Audio recording format/applicable bit rate: Dolby Digital 2 ch
256 kbps/128 kbps (in EP and SLP mode)

➡continued

Inputs and outputs

LINE 2 OUT
(AUDIO): Phono jack/2 Vrms/10 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.3 Vp-p (PAL)
LINE 2 IN
(AUDIO): Phono jack/2 Vrms/more than 22 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.3 Vp-p (PAL)
LINE 1 – TV: 21-pin
CVBS IN/OUT
S-Video/RGB OUT (upstream)
LINE 3/DECODER: 21-pin
CVBS IN/OUT
S-Video/RGB IN
S-Video OUT (downstream)
Decoder
DV IN: 4-pin/i.LINK S100
DIGITAL OUT (OPTICAL):
Optical output jack/–18 dBm (wave length: 660 nm)
DIGITAL OUT (COAXIAL): Phono jack/0.5 Vp-p/75 ohms
COMPONENT VIDEO OUT (Y, P_B/C_B, P_R/C_R):
Phono jack/Y: 1.0 Vp-p, P_B/C_B: 0.7 Vp-p, P_R/C_R: 0.7 Vp-p
G-LINK: mini jack
HDMI OUT: HDMI 19pin-Standard Connector

General

Power requirements: 220-240 V AC, 50/60 Hz
Power consumption: 46 W
Dimensions (approx.):
430 × 73 × 328 mm (width/height/depth) incl. projecting parts
Hard disk drive capacity: 160 GB
Mass (approx.): 4.7 kg
Operating temperature: 5ºC to 35ºC
Operating humidity: 25% to 80%

Supplied accessories:

Mains lead (1)
Aerial cable (1)
Remote commander (remote) (1)
Set top box controller (1)
R6 (size AA) batteries (2)

Specifications and design are subject to change without notice.

Compatible colour systems

This recorder is designed to record using the PAL colour system and play back using the PAL or NTSC colour systems.
The signals of the SECAM colour system can be received or recorded but played back in the PAL colour system only. Recording of video sources based on other colour systems cannot be guaranteed.

About i.LINK

The DV IN jack on this recorder is i.LINK-compliant for digital video cameras. This section describes the i.LINK standard and its features.

What is i.LINK?

i.LINK is a digital serial interface for handling digital video, digital audio and other data in two directions between equipment having the i.LINK jack, and for controlling other equipment.
i.LINK-compatible equipment can be connected by a single i.LINK cable. Possible applications are operations and data transactions with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to this recorder in a daisy chain, operations and data transactions are possible with not only the equipment that this recorder is connected to but also with other devices via the directly connected equipment.
Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the equipment to be connected, and that operations and data transactions are sometimes not possible on some connected equipment.

Note

Normally, only one piece of equipment can be connected to this recorder by the i.LINK cable (DV connecting cable). When connecting this recorder to i.LINK-compatible equipment having two or more i.LINK jacks (DV jacks), see the instruction manual of the equipment to be connected.

About the name "i.LINK"

i.LINK is a more familiar term for IEEE 1394 data transport bus proposed by SONY, and is a trademark approved by many corporations. IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

i.LINK baud rate

i.LINK's maximum baud rate varies according to the equipment. Three maximum baud rates are defined:
S100 (approx. 100 Mbps*)
S200 (approx. 200 Mbps)
S400 (approx. 400 Mbps)

The baud rate is listed under "Specifications" in the instruction manual of each equipment. It is also indicated near the i.LINK jack on some equipment.
The maximum baud rate of equipment on which it is not indicated such as this unit is "S100."
When units are connected to equipment having a different maximum baud rate, the baud rate sometimes differs from the indicated baud rate.

* What is Mbps?
Mbps stands for megabits per second, or the amount of data that can be sent or received in one second. For example, a baud rate of 100 Mbps means that 100 megabits of data can be sent in one second.

i.LINK functions on this recorder

For details on how to dub when this recorder is connected to other video equipment having DV jacks, see page 91.
The DV jack on this recorder can only input DVC-SD signals. It cannot output signals.
The DV jack will not accept MICRO MV signals from equipment such as a MICRO MV digital video camera with an i.LINK jack.
For further precautions, see the notes on page 91.
For details on precautions when connecting this recorder, also see the instruction manuals for the equipment to be connected.

Required i.LINK cable

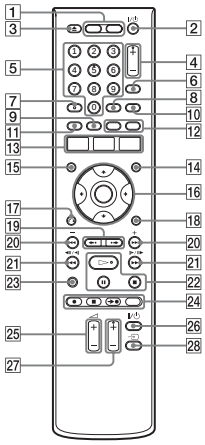
Use the Sony i.LINK 4-pin-to-4-pin cable (during DV dubbing).

i.LINK and i, are trademarks.

Guide to Parts and Controls

For more information, see the pages in parentheses.

Remote



1 HDD button (33)
DVD button (33)

2 I/⏻ (on/standby) button (25)

3 ⏏ (open/close) button (33)

4 PROG (programme) +/– buttons (33)
The + button has a tactile dot*.

5 Number buttons (57, 72)
The number 5 button has a tactile dot*.

6 INPUT SELECT button (65, 91)

7 AUDIO button (68)
The AUDIO button has a tactile dot*.

8 SUBTITLE button (68)

9 MENU/Green button (66)

10 TV/DVD button (22)

11 TOP MENU/Red button (66)

12 CHAPTER MARK/Yellow button (81)
CHAPTER MARK ERASE/Blue button (81)

13 SYSTEM MENU button (94, 96)
TITLE LIST button (35, 66, 78)
TV GUIDE button (45)

14 INFO (information) button (45)

15 SCHEDULE button (57)

16 ←/↑/↓/→/ENTER button (25)

17 RETURN button (78)

18 OPTIONS button (43)

19 PAGE ←•/•→ buttons (35, 73)

20 I◄◄ /►►I (previous/next)/DAY +/– buttons (68)

21 ◄◄/◄II/◄I/I►/II►/►►/ (search/slow/freeze frame) buttons (68)

22 ▷ (play) button (66)
II (pause) button (68)
■ (stop) button (66)
The ▷ button has a tactile dot*.

23 DISPLAY button (37)

24 ● REC button (33)
■ REC STOP button (33)
→ ● SYNCHRO REC button (63)
REC MODE button (33)

25 TV ◿ (volume) +/– buttons (22)

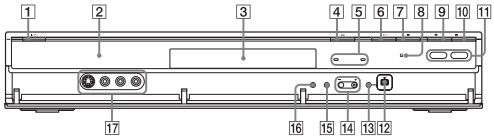
26 TV I/⏻ (on/standby) button (22)

27 TV PROG (programme) +/– buttons (22)
The + button has a tactile dot*.

28 TV ⏀ button (22)

* Use the tactile dot as a reference when operating the recorder.

Front panel



1 I/⏻ (on/standby) button (25)

2 Front panel display (126)

3 Disc tray (33)

4 ⏏ (open/close) button (33)

5 TIMER REC indicator (56)
SYNCHRO REC indicator (63)

6 ▷ (play) button (66)

7 ■ (stop) button (66)

8 (remote sensor) (22)

9 ● REC button (33)

10 ■ REC STOP button (33)

11 HDD button/indicator (33)
DVD button/indicator (33)

12 DV IN jack (91)

13 ONE-TOUCH DUB button (93)

14 PROGRAM +/– buttons (33)
The + button has a tactile dot*.

15 INPUT SELECT button (63, 91)

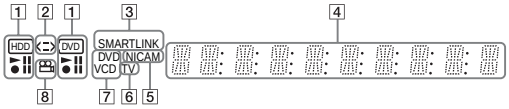
16 REC MODE button (33)

17 LINE 2 IN (S VIDEO/VIDEO/L(MONO) AUDIO R) jacks (29)

* Use the tactile dot as a reference when operating the recorder.

→continued

Front panel display



1 HDD/DVD indicators
Displays the selected media and the playing/recording status.

2 Dubbing direction indicator

3 SMARTLINK indicator (18)

4 Displays the following:
- Playing time
- Current title/chapter/track/index number
- Recording time/recording mode
- Clock
- Programme position
- TV Direct Rec indication (33): "TV" appears in the right most two digits.

5 NICAM indicator (55)

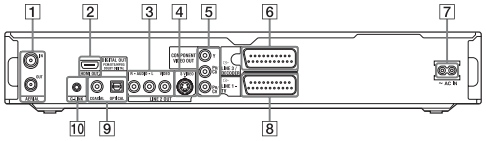
6 TV indicator (33)

7 Disc type*

8 (angle) indicator (66)

* Displays DATA CDs as "CD."

Rear panel



1 AERIAL IN/OUT jacks (13)

2 HDMI OUT (high-definition multimedia interface out) jack (17, 20)

3 LINE 2 OUT (R-AUDIO-L/VIDEO) jacks (17, 20)

4 LINE 2 OUT (S VIDEO) jack (17)

5 COMPONENT VIDEO OUT (Y, PB/CB, PR/CR) jacks (17)

6 LINE 3/DECODER jack (15)

7 AC IN terminal (21)

8 LINE 1 – TV jack (17)

9 DIGITAL OUT (COAXIAL/OPTICAL) jack (20)

10 G-LINK jack (13)

Language Code List

For details, see page 109.

The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code	Language	Code	Language	Code	Language	Code	Language
1027	Afar	1183	Irish	1347	Maori	1507	Samoan
1028	Abkhazian	1186	Scots Gaelic	1349	Macedonian	1508	Shona
1032	Afrikaans	1194	Galician	1350	Malayalam	1509	Somali
1039	Amharic	1196	Guarani	1352	Mongolian	1511	Albanian
1044	Arabic	1203	Gujarati	1353	Moldavian	1512	Serbian
1045	Assamese	1209	Hausa	1356	Marathi	1513	Siswati
1051	Aymara	1217	Hindi	1357	Malay	1514	Sesotho
1052	Azerbaijani	1226	Croatian	1358	Maltese	1515	Sundanese
1053	Bashkir	1229	Hungarian	1363	Burmese	1516	Swedish
1057	Byelorussian	1233	Armenian	1365	Nauru	1517	Swahili
1059	Bulgarian	1235	Interlingua	1369	Nepali	1521	Tamil
1060	Bihari	1239	Interlingue	1376	Dutch	1525	Telugu
1061	Bislama	1245	Inupiak	1379	Norwegian	1527	Tajik
1066	Bengali; Bangla	1248	Indonesian	1393	Occitan	1528	Thai
		1253	Icelandic	1403	(Afan)Oromo	1529	Tigrinya
1067	Tibetan	1254	Italian	1408	Oriya	1531	Turkmen
1070	Breton	1257	Hebrew	1417	Punjabi	1532	Tagalog
1079	Catalan	1261	Japanese	1428	Polish	1534	Setswana
1093	Corsican	1269	Yiddish	1435	Pashto; Pushto	1535	Tonga
1097	Czech	1283	Javanese			1538	Turkish
1103	Welsh	1287	Georgian	1436	Portuguese	1539	Tsonga
1105	Danish	1297	Kazakh	1463	Quechua	1540	Tatar
1109	German	1298	Greenlandic	1481	Rhaeto-Romance	1543	Twi
1130	Bhutani	1299	Cambodian			1557	Ukrainian
1142	Greek	1300	Kannada	1482	Kirundi	1564	Urdu
1144	English	1301	Korean	1483	Romanian	1572	Uzbek
1145	Esperanto	1305	Kashmiri	1489	Russian	1581	Vietnamese
1149	Spanish	1307	Kurdish	1491	Kinyarwanda	1587	Volapük
1150	Estonian	1311	Kirghiz	1495	Sanskrit	1613	Wolof
1151	Basque	1313	Latin	1498	Sindhi	1632	Xhosa
1157	Persian	1326	Lingala	1501	Sangho	1665	Yoruba
1165	Finnish	1327	Laothian	1502	Serbo-Croatian	1684	Chinese
1166	Fiji	1332	Lithuanian			1697	Zulu
1171	Faroese	1334	Latvian; Lettish	1503	Singhalese		
1174	French			1505	Slovak		
1181	Frisian	1345	Malagasy	1506	Slovenian	1703	Not specified

Area Code

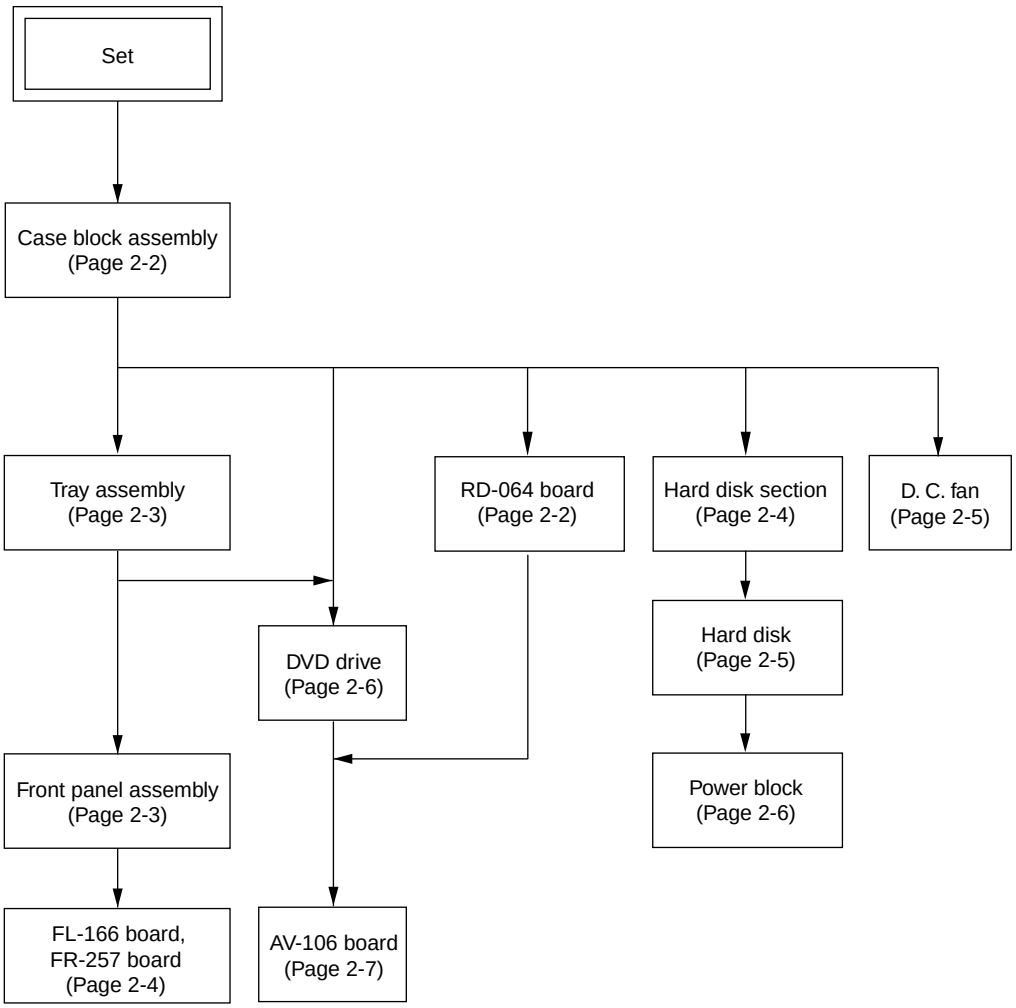
For details, see page 108.

Code	Area	Code	Area	Code	Area	Code	Area
2044	Argentina	2165	Finland	2362	Mexico	2149	Spain
2047	Australia	2174	France	2376	Netherlands	2499	Sweden
2046	Austria	2109	Germany	2390	New Zealand	2086	Switzerland
2057	Belgium	2248	India	2379	Norway	2528	Thailand
2070	Brazil	2238	Indonesia	2427	Pakistan	2184	United Kingdom
2079	Canada	2254	Italy	2424	Philippines		
2090	Chile	2276	Japan	2436	Portugal		
2092	China	2304	Korea	2489	Russia		
2115	Denmark	2363	Malaysia	2501	Singapore		

MEMO

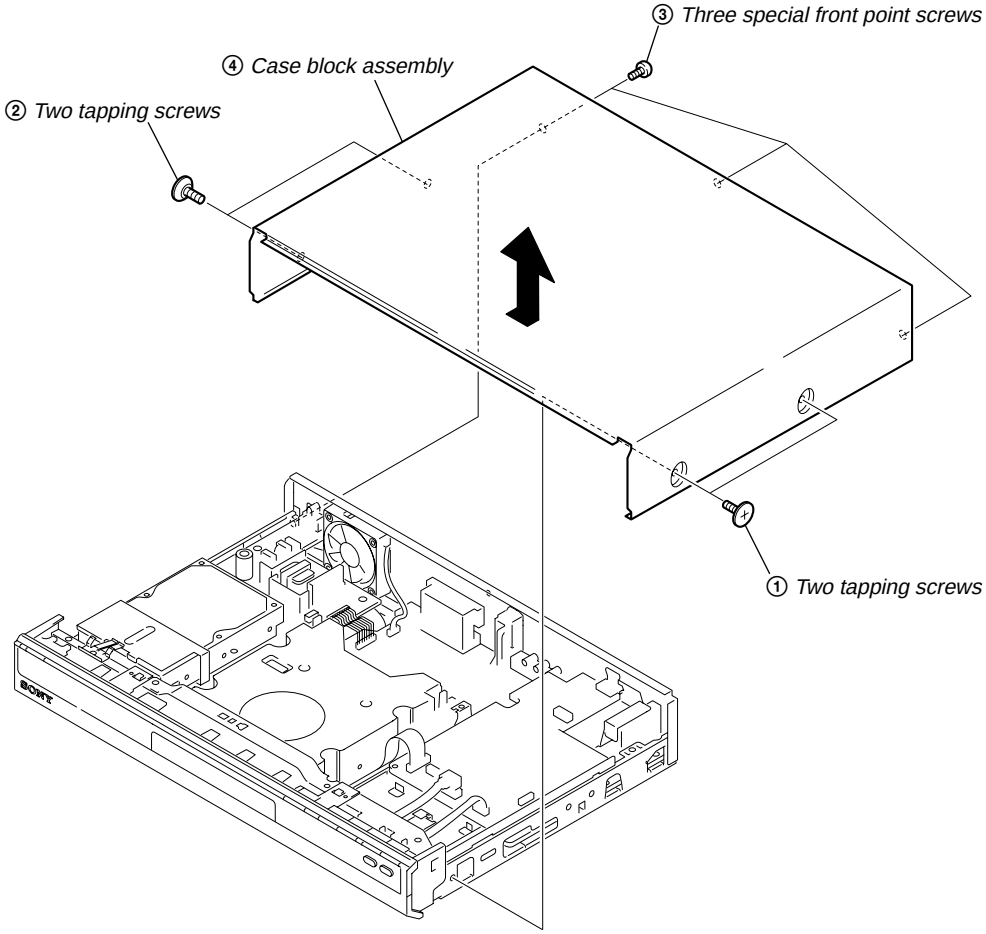
SECTION 2
DISASSEMBLY

NOTE: The following flow chart shows the disassembly procedure.

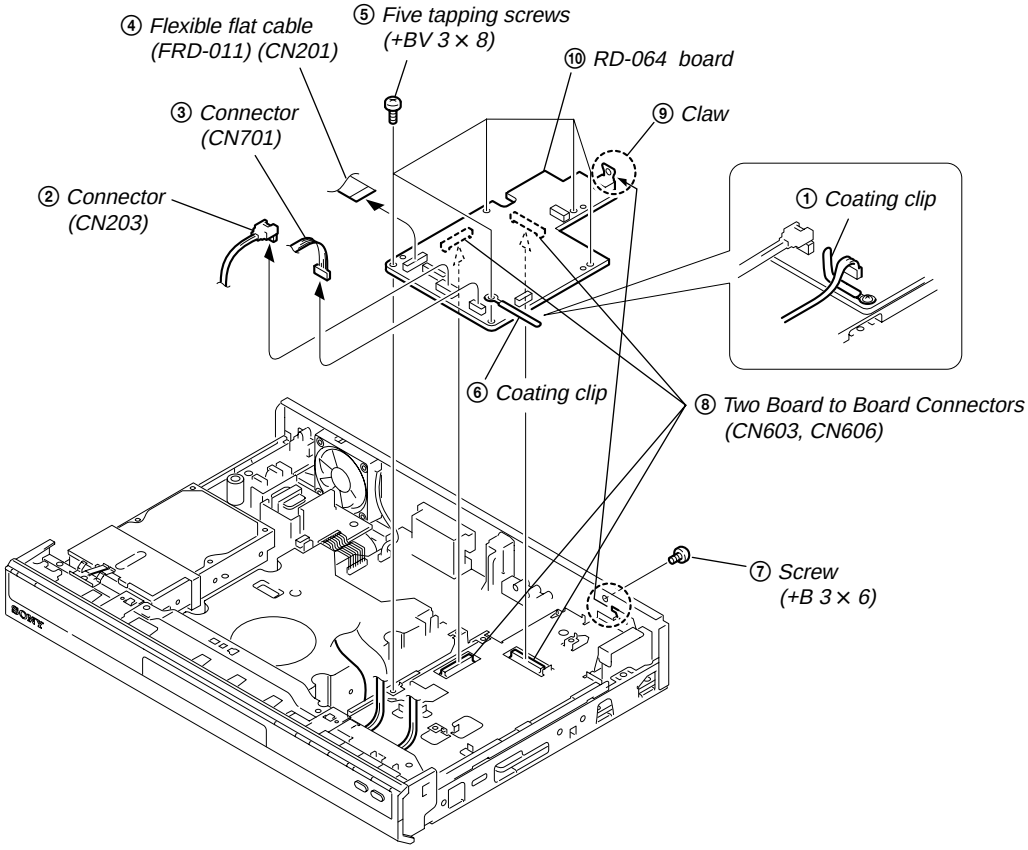


NOTE: Follow the disassembly procedure in the numerical order given.

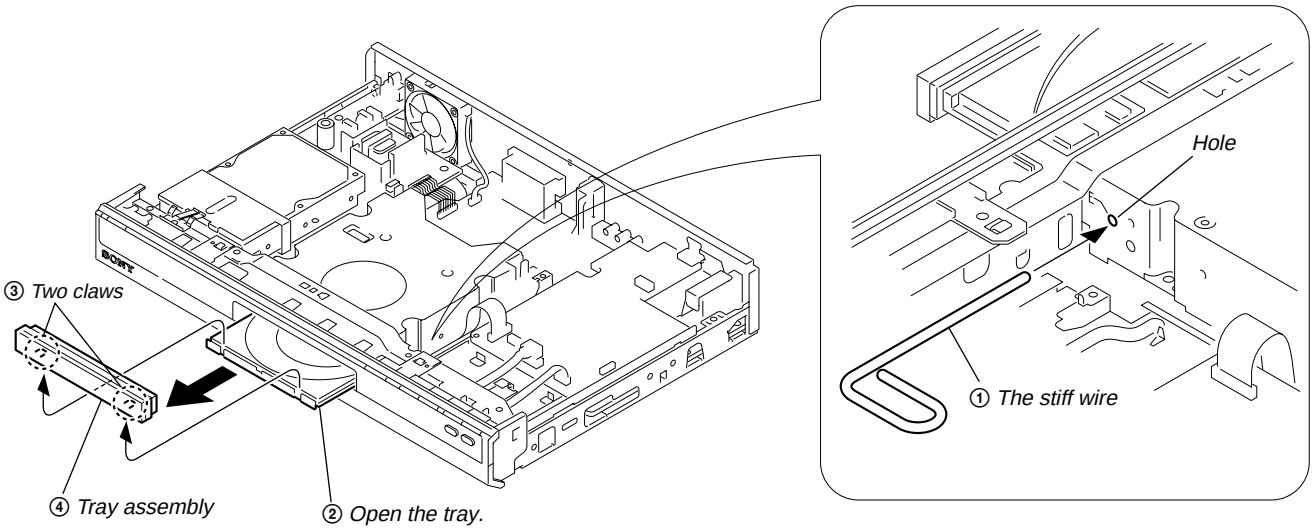
2-1. CASE BLOCK ASSEMBLY



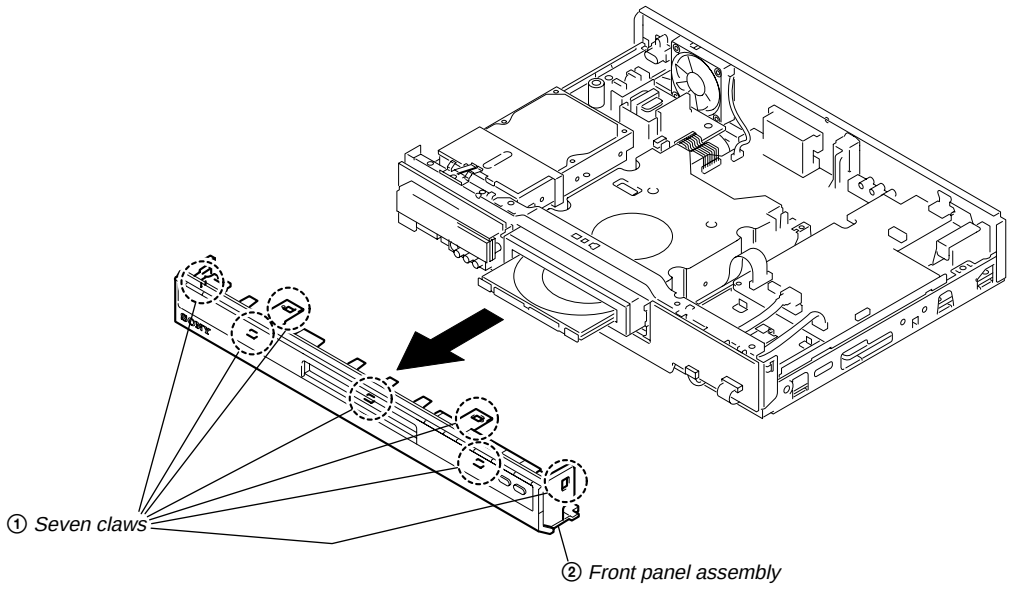
2-2. RD-064 BOARD


④ Flexible flat cable (FRD-011) (CN201)
⑤ Five tapping screws (+BV 3 × 8)
⑩ RD-064 board
③ Connector (CN701)
⑨ Claw
② Connector (CN203)
① Coating clip
⑥ Coating clip
⑧ Two Board to Board Connectors (CN603, CN606)
⑦ Screw (+B 3 × 6)

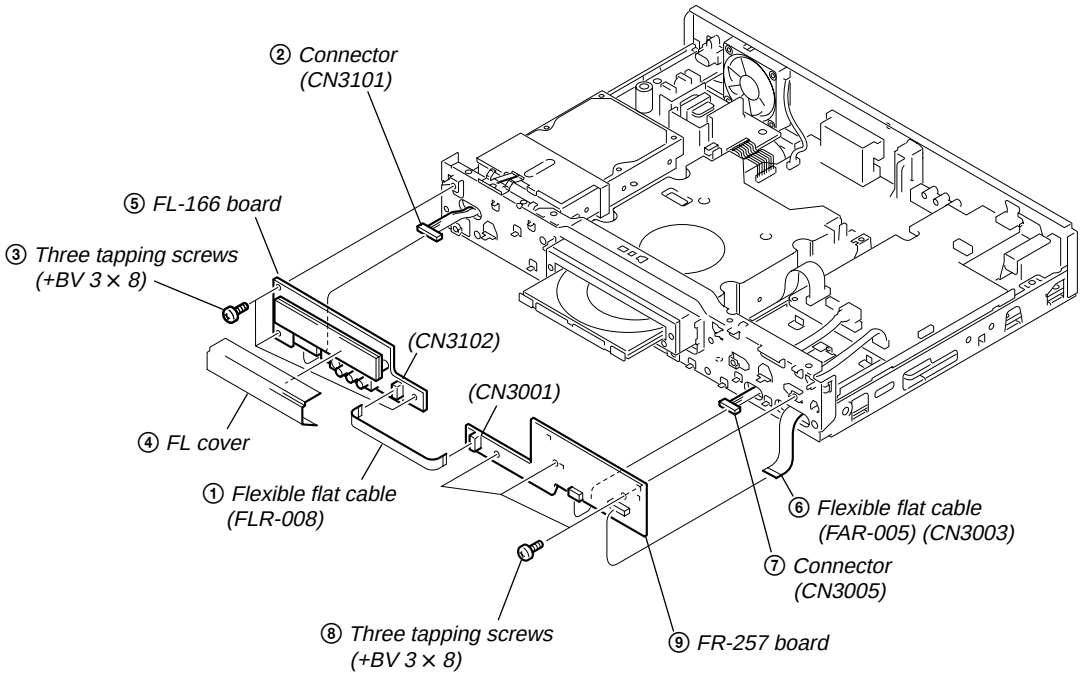
2-3. TRAY ASSEMBLY



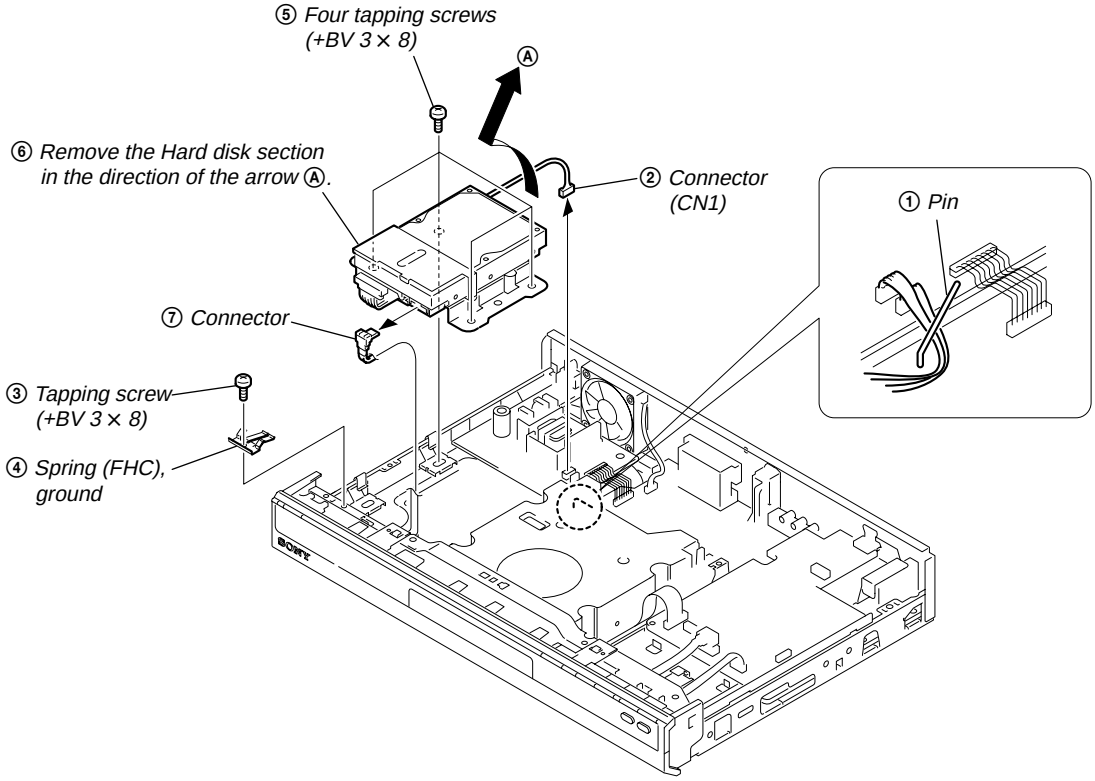
2-4. FRONT PANEL ASSEMBLY



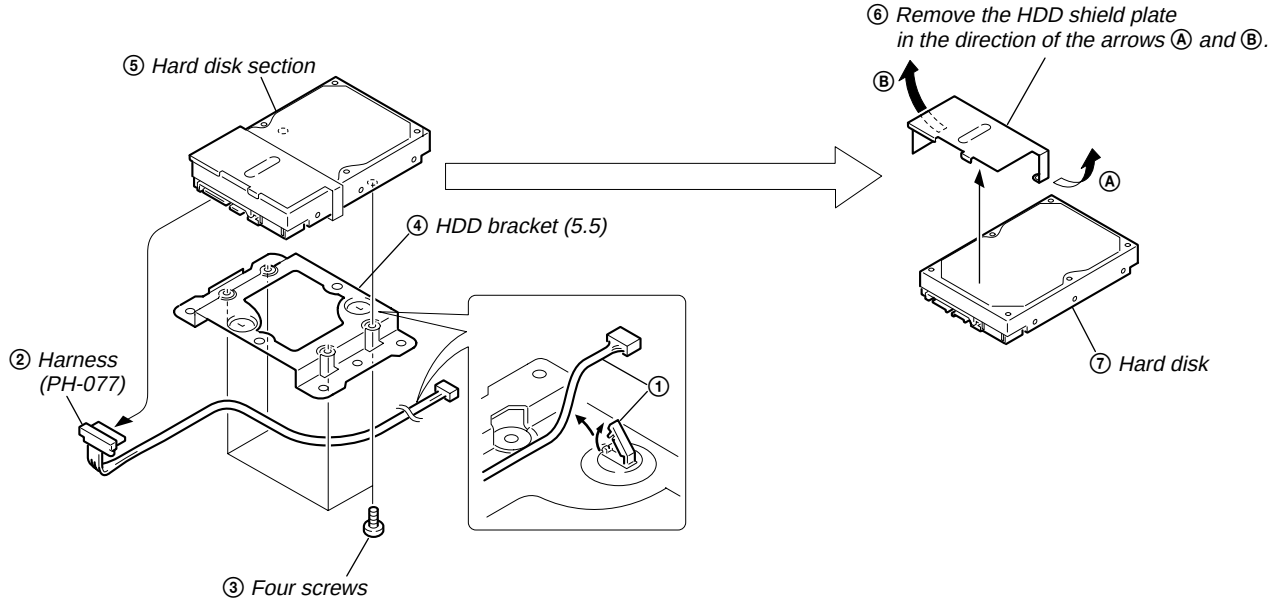
2-5. FL-166 BOARD, FR-257 BOARD



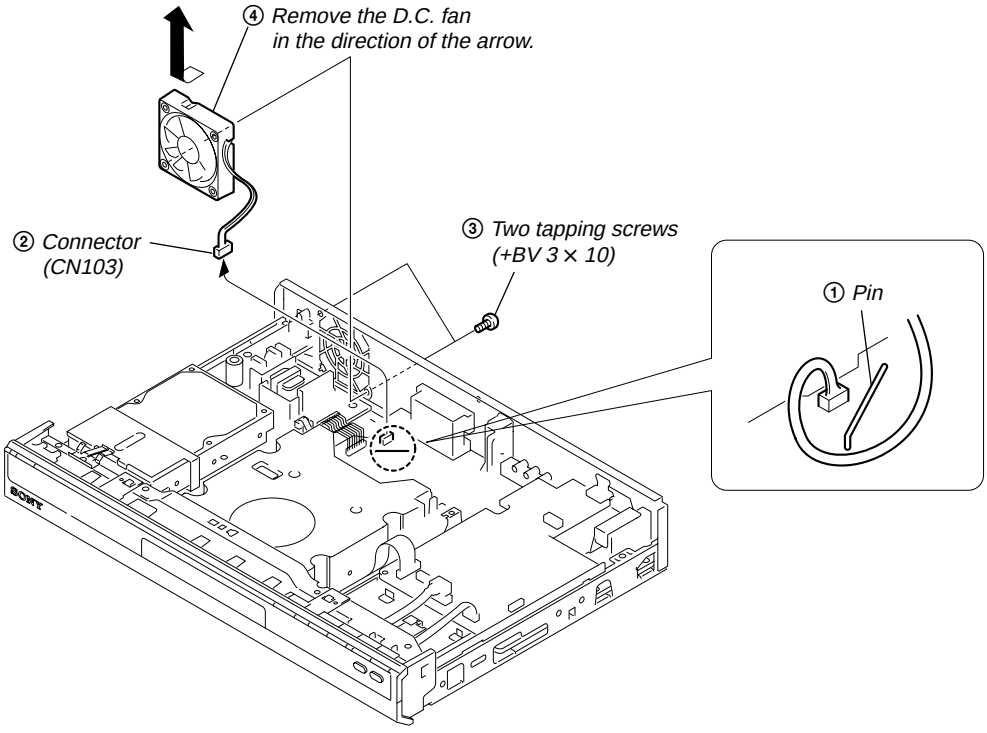
2-6. HARD DISK SECTION



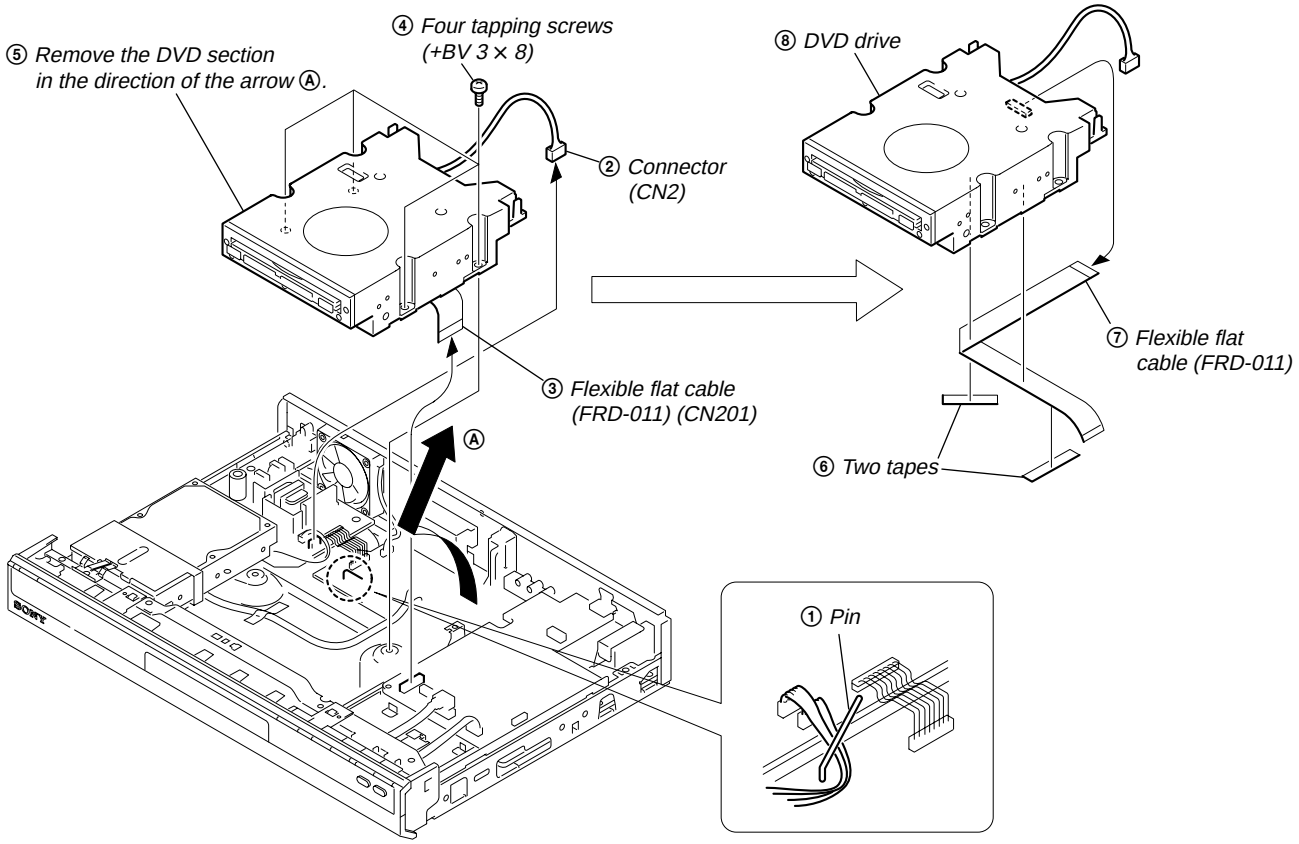
2-7. HARD DISK



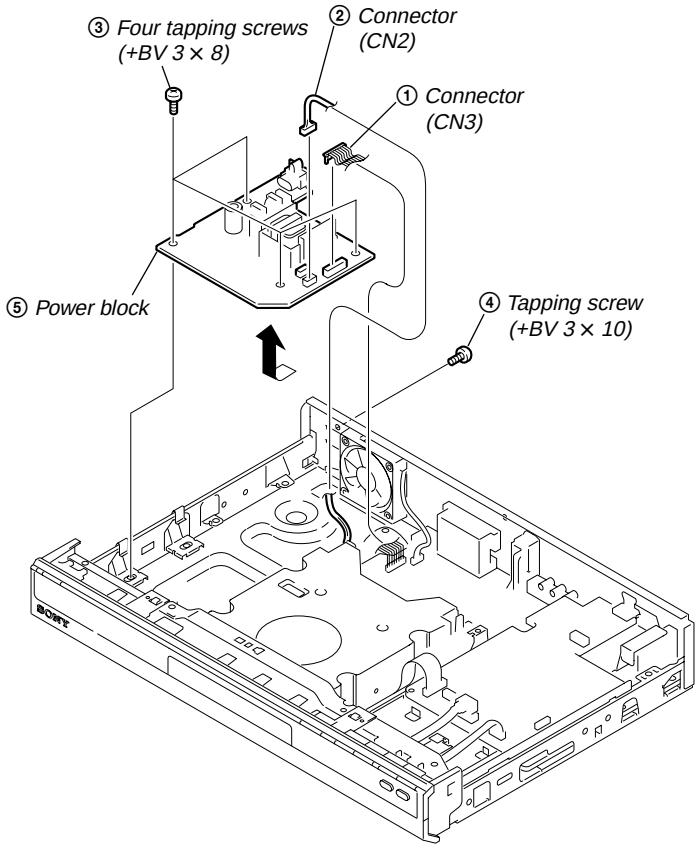
2-8. D. C. FAN



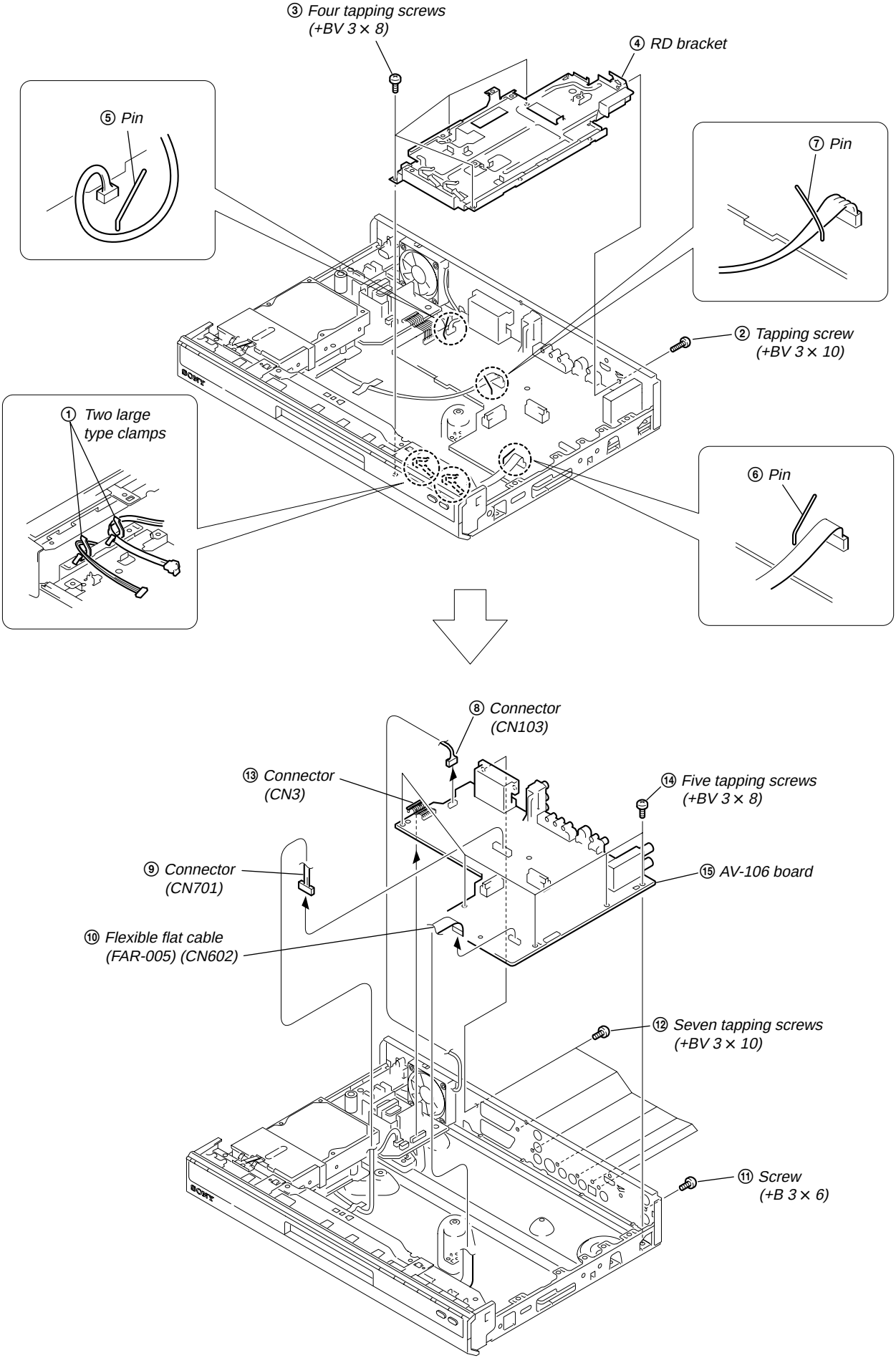
2-9. DVD DRIVE



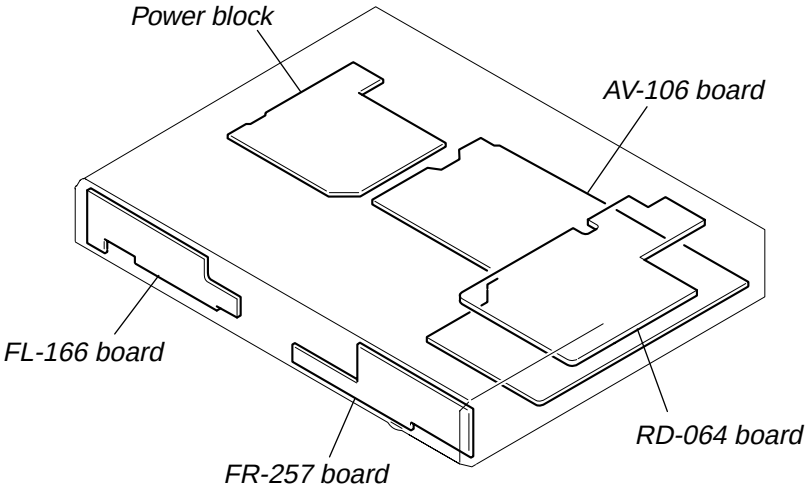
2-10. POWER BLOCK



2-11. AV-106 BOARD

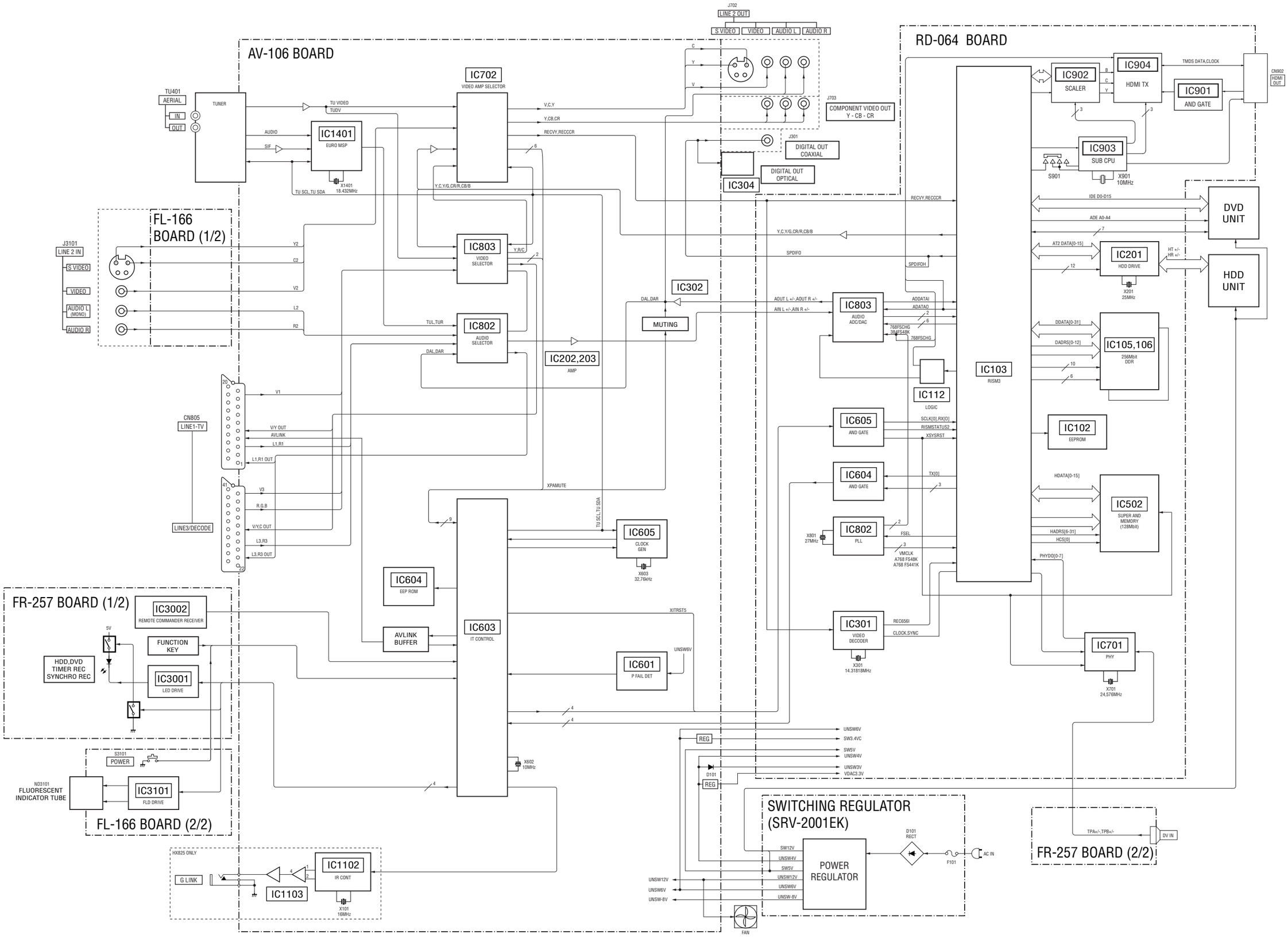

③ Four tapping screws (+BV 3 × 8)
④ RD bracket
⑤ Pin
⑦ Pin
② Tapping screw (+BV 3 × 10)
① Two large type clamps
⑥ Pin
⑧ Connector (CN103)
⑬ Connector (CN3)
⑭ Five tapping screws (+BV 3 × 8)
⑨ Connector (CN701)
⑮ AV-106 board
⑩ Flexible flat cable (FAR-005) (CN602)
⑫ Seven tapping screws (+BV 3 × 10)
⑪ Screw (+B 3 × 6)

2-12. CIRCUIT BOARDS LOCATION

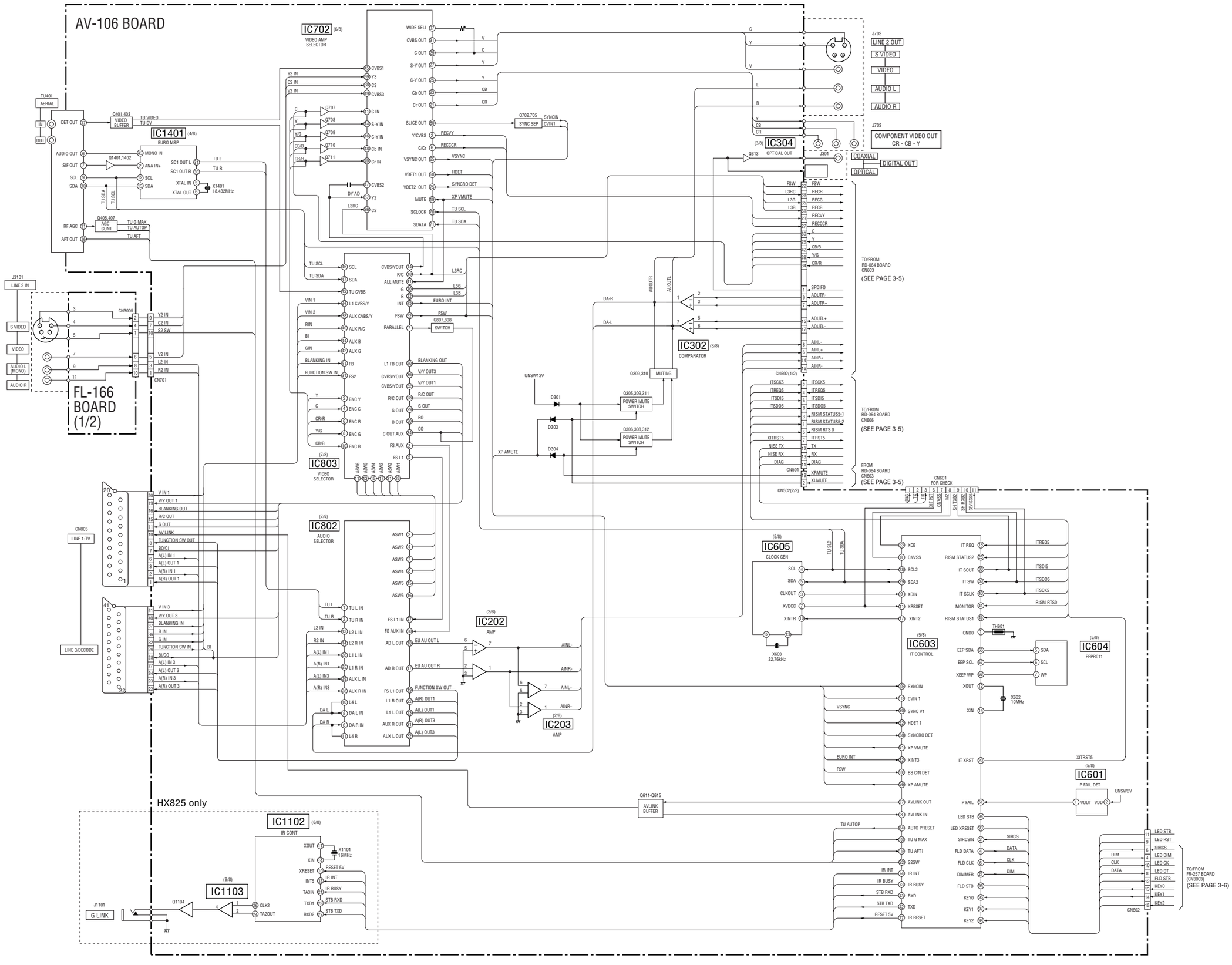


SECTION 3
BLOCK DIAGRAMS

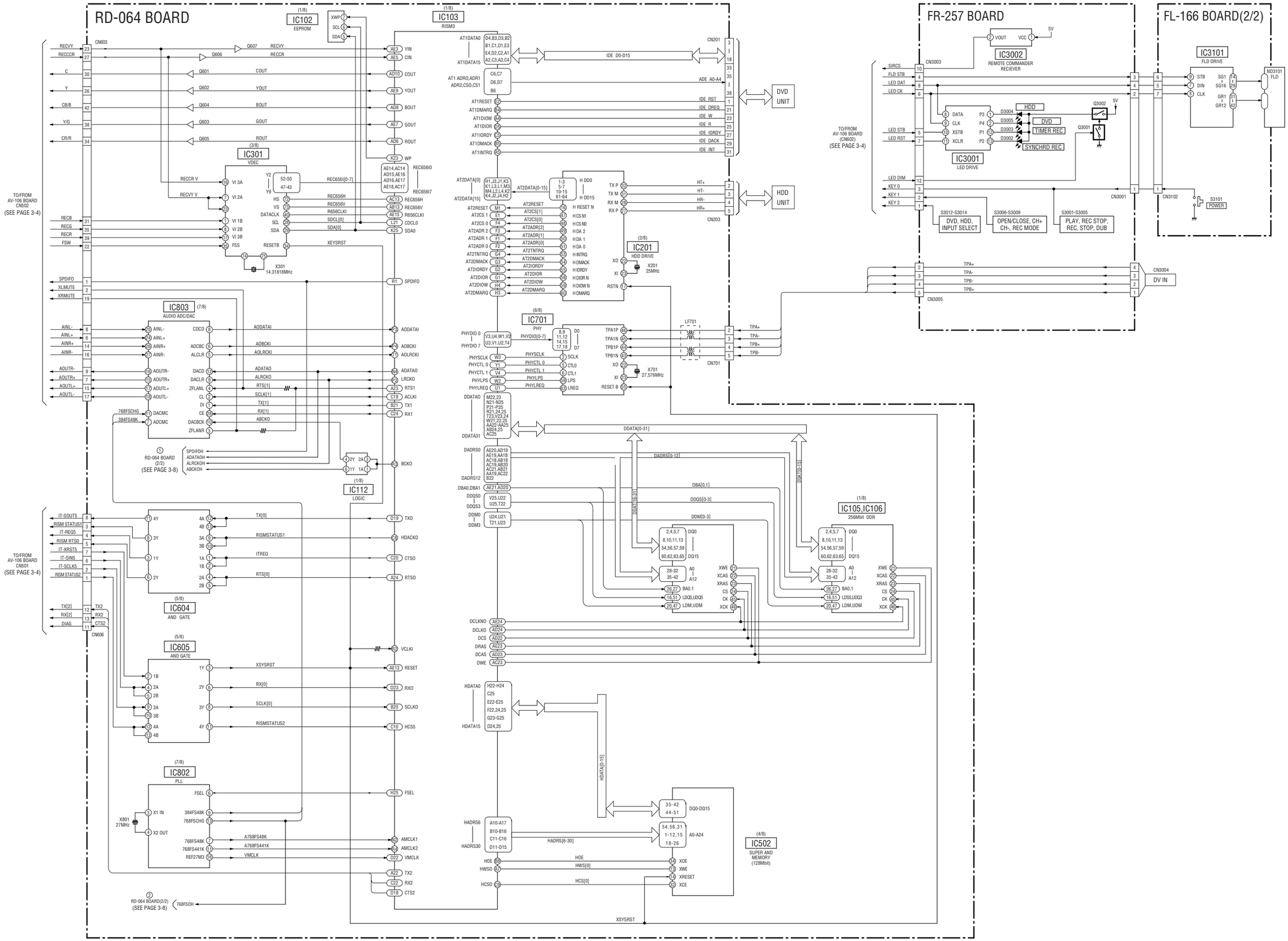
3-1. OVERALL BLOCK DIAGRAM



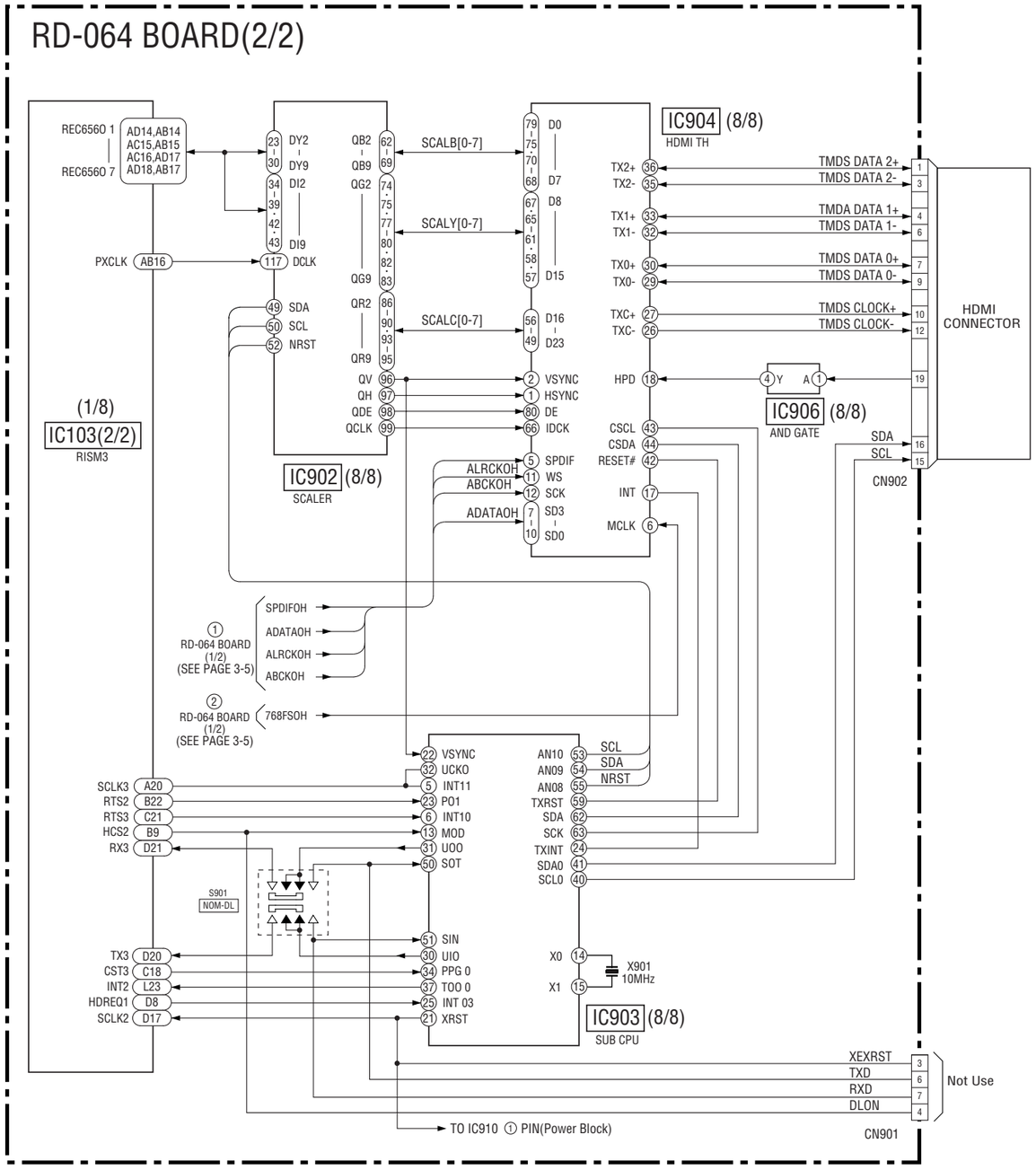
3-2. AV-106 BLOCK DIAGRAM



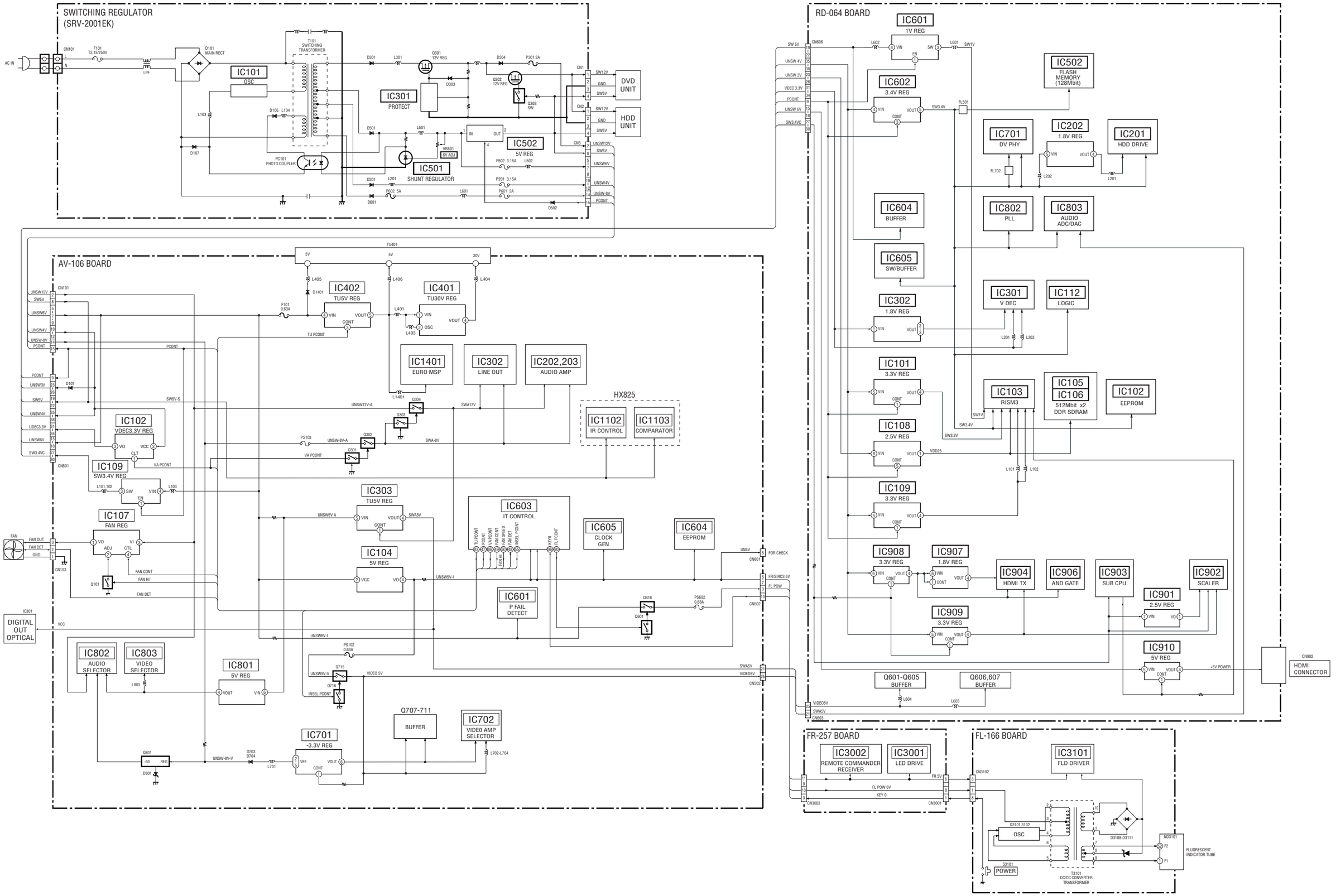
3-3. RD-064 (1/2) BLOCK DIAGRAM



3-4. RD-064 (2/2) BLOCK DIAGRAM



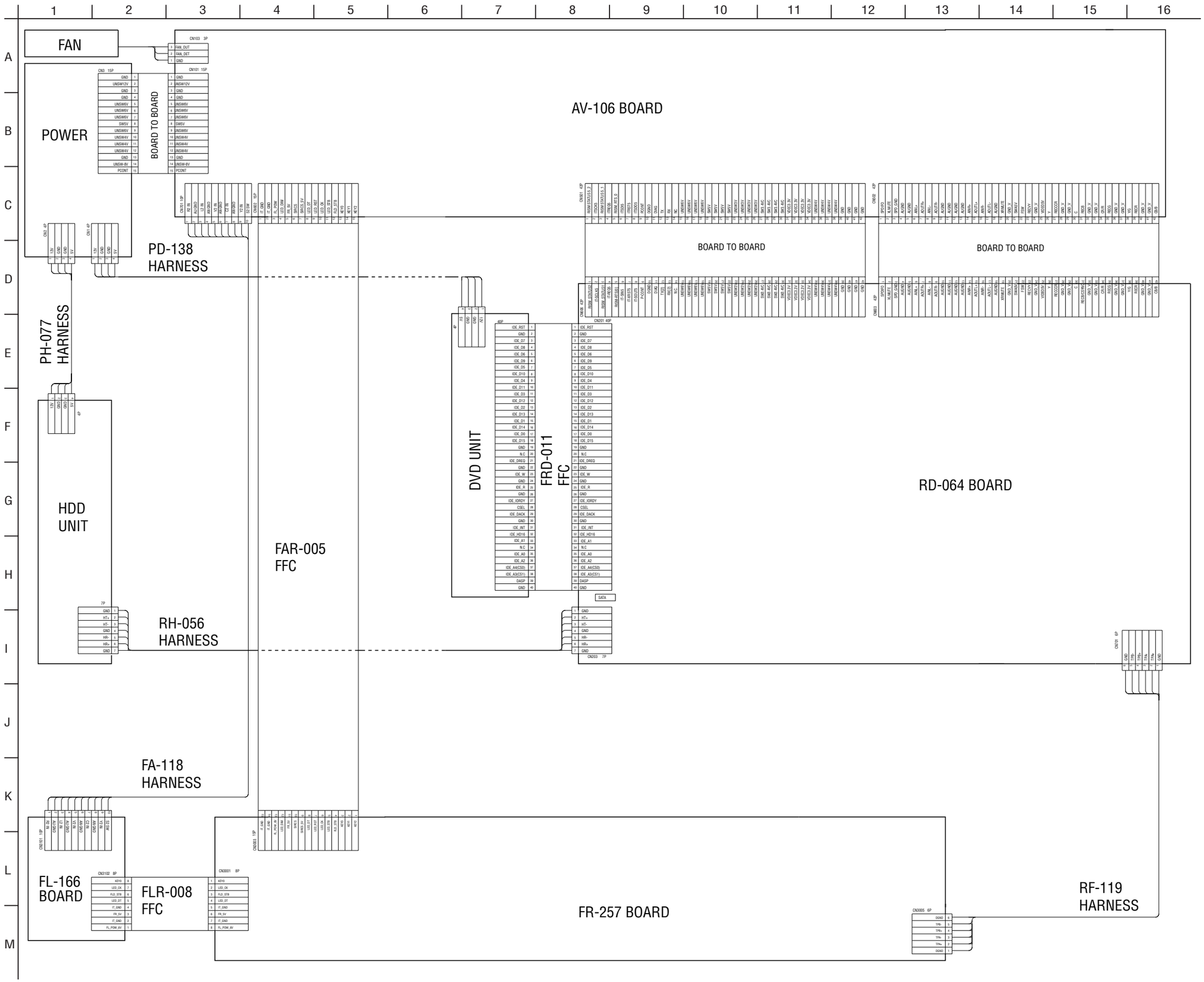
3-5. POWER BLOCK DIAGRAM



MEMO

SECTION 4
SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

4-1. FRAME SCHEMATIC DIAGRAM



4-2. SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/4 W (Chip resistors : 1 /10 W) un-less otherwise specified.
  kΩ=1000Ω, MΩ=1000kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, be-cause it is damaged by the heat.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : non flammable resistor
- : fusible resistor
- : panel designation
- △ : internal component
- : adjustment for repair
- ▷ : IN/OUT direction of (+/–) B line
- B + : B+ Line
- B − : B– Line
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point and ground.
- Readings are taken with a color-bar signals on DVD reference disc.
- Readings are taken with a digital multimeter (DC 10MW).
- Voltage variations may be noted due to normal production toler-ances.

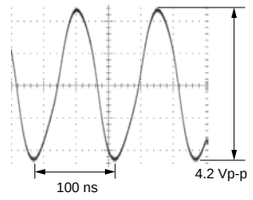
Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

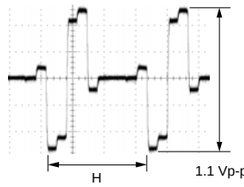
WAVEFORMS

AV-106 BOARD

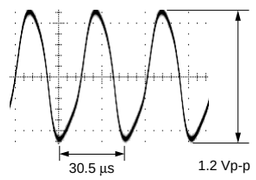
① X602



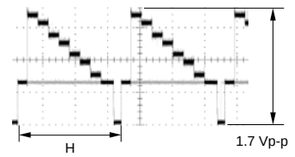
⑦ J703 COMPONENT PR



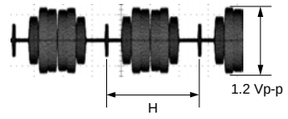
② X603



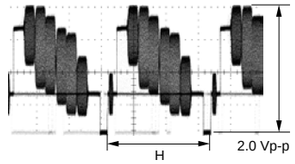
⑧ J703 COMPONENT Y



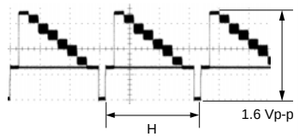
③ J702 S-VIDEO C



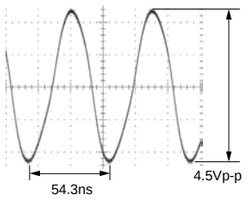
⑨ CN805 ㊵



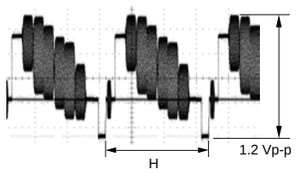
④ J702 S-VIDEO Y



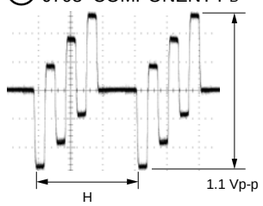
⑩ X1401 (RDR-HX820)



⑤ J702 VIDEO

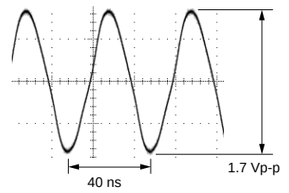


⑥ J703 COMPONENT PB

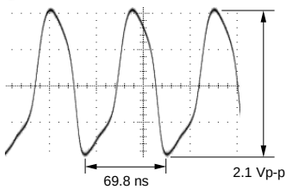


RD-064 BOARD

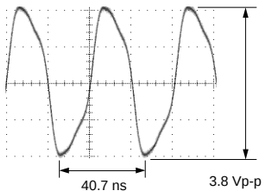
① X201



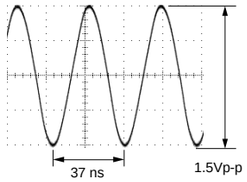
② X301



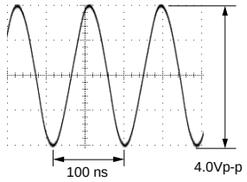
③ X701



④ X801



⑤ X901



For Schematic Diagram

• Refer to page 4-43 for printed wiring board.

AV-106 BOARD(1/8)

POWER

-REF.NO.: 10,000 SERIES-

NO MARK:REC/PB MODE

CN101 15P

TO SWITCHING REGULATOR CN3 (SEE PAGE 4-42)

GND 1 JL101
UNSW12V 2 JL102
GND 3 JL103
GND 4
UNSW6V 5
UNSW6V 6 JL104 JL105
UNSW6V 7 JL106
SW5V 8 JL107
UNSW6V 9 JL108
UNSW4V 10 JL109
UNSW4V 11 JL110
UNSW4V 12 JL112
GND 13 JL111
UNSW-8V 14 JL113
PCONT 15

R111 10k

DC FAN

CN103 3P

FAN_OUT 1 JL116
FAN_DET 2 JL121
GND 3

R160 0
R154 0
R135 0
R137 0
R140 0
R142 0
R144 0
R146 0
R148 0
R168 0
R169 0
R170 0
F101 0.63A
PS102 0.63A
PS103 0.63A

UNSW5V-V
GND-V
UNSW-8V-V
UNSW-8V-V
GND-V
UNSW6V-A
UNSW12V-A
UNSW12V-A
UNSW6V-A
UNSW-8V-A
GND-A
VA_PCONT
PCONT
FAN_DET
FAN_HI
FAN_CONT
UNSW6V-I
GND-V
GND
UNSW5V-I
UNSW6V-T
GND-T
GND-I
GND-T
SW5V-S
GND-V

1 TO(6/8)
2 TO(7/8)
3 TO(3/8)
4 TO(3/8,5/8)
5 TO(5/8)
6 TO(4/8)
7 TO(8/8)
8 TO(2/8)

IC107
FAN DRIVE

IC104
UNSW5V REG

IC104
TK73400AU3G0L-C

IC102
VDEC 3.3V REG

IC102
SI-3033KS-TL
GND GND GND GND SENSE
CTL VCC VO VO
8 7 6 5
1 2 3 4
5.0 4.3 3.3 3.3

IC107
TK11100CSCB-G
VI ADJ VO
CTL GND NP
3 2 1
4 5 6
11.9 1.3 7.8
5.1 1.3

IC104
CTL VCC GND VO ADJ
1 2 3 4 5
5.8 5.8 5.2 1.2

C117 100p
C124 470u 10V
C151 0.01u 16V
C105 1u 10V
C106 10u 6.3V
C120 1u B 25V
C119 1u B 25V
C118 0.01u B
C123 47u 25V
C114 1u B 10V
C155 47u 16V
C130 0.1 B 16V
C131 0.1 B 16V
C135 10 C 10V
C107 10 C 10V
C108 10 C 10V
C125 10 C 10V
C159 10 B 6.3V
C160 10 B 6.3V
C129 10 B 6.3V
C127 0.1 B 16V

D101
EC21QS03L-TE12L

R102 0
R175 0
R173 0
R174 0
R162 0
R176 0

SW5V-R
UNSW4V
UNSW3V
GND-R
VREC3.3V
UNSW6V-R
SW3.4VC

R113 120k ±0.5%
R114 15k ±0.5%
R115 8200 ±0.5%
R120 0
R121 39k ±0.5%
R122 12k ±0.5%
R108 4.7k 1/10W
R118 10
R104 470k 0.5%
R107 100k 0.5%
C128 470p B 50V

Q101
MUN2213T1
SWITCH
0.5
0.1

JL114
JL120

B+
B-

TO(5/8)
11

IC109
3.4V REG

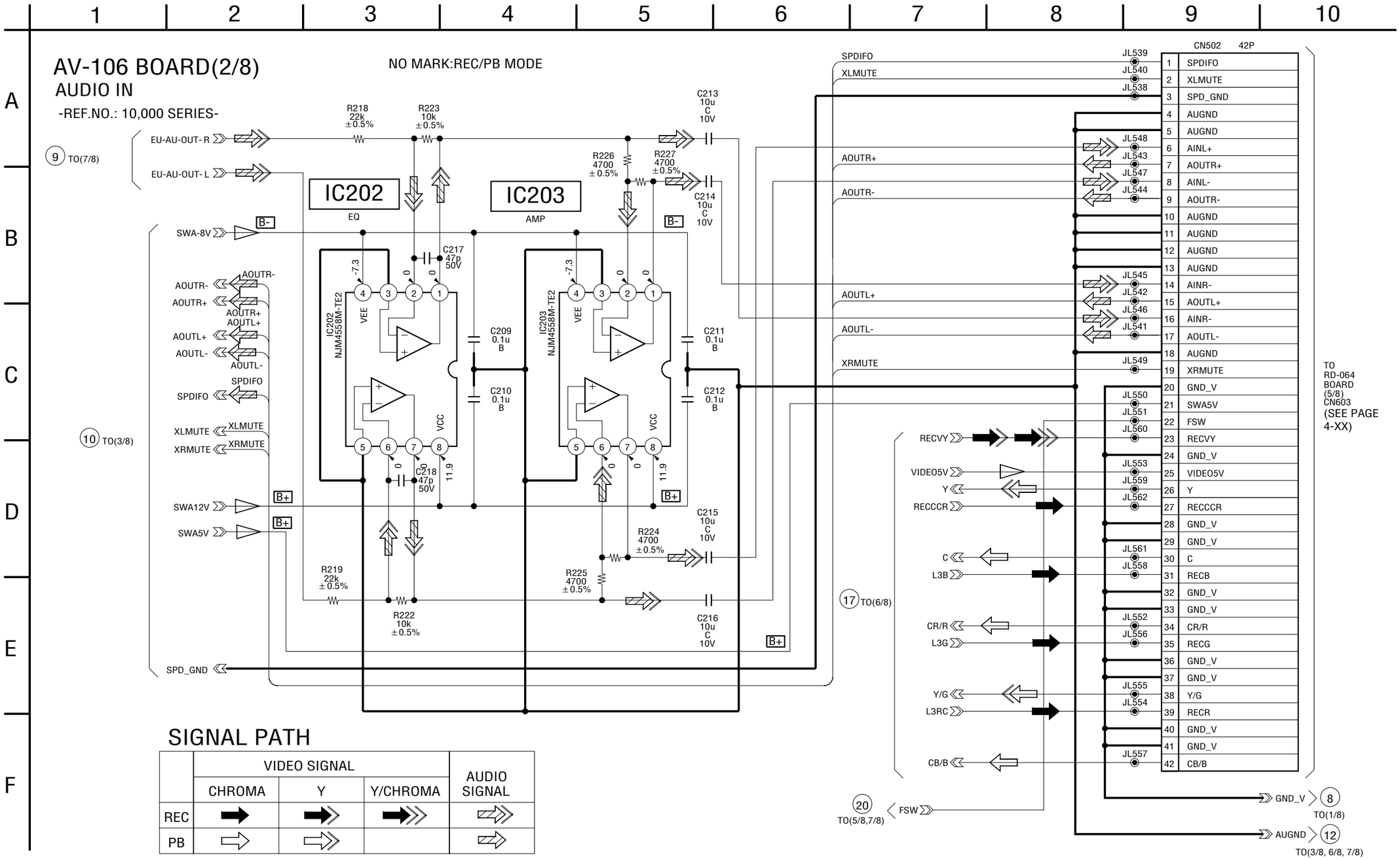
IC109
MP2105DJ-LF-Z
FB VIN
EN GND SW
5 4
1 2 3

FB1609 0uH C
L103 4.7uH
L101 4.7uH
L102 4.7uH
FB1608 0uH C

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

For Schematic Diagram

• Refer to page 4-43 for printed wiring board.



SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB	⇨	⇨		⇨

For Schematic Diagram

• Refer to page 4-43 for printed wiring board.

AV-106 BOARD(3/8)

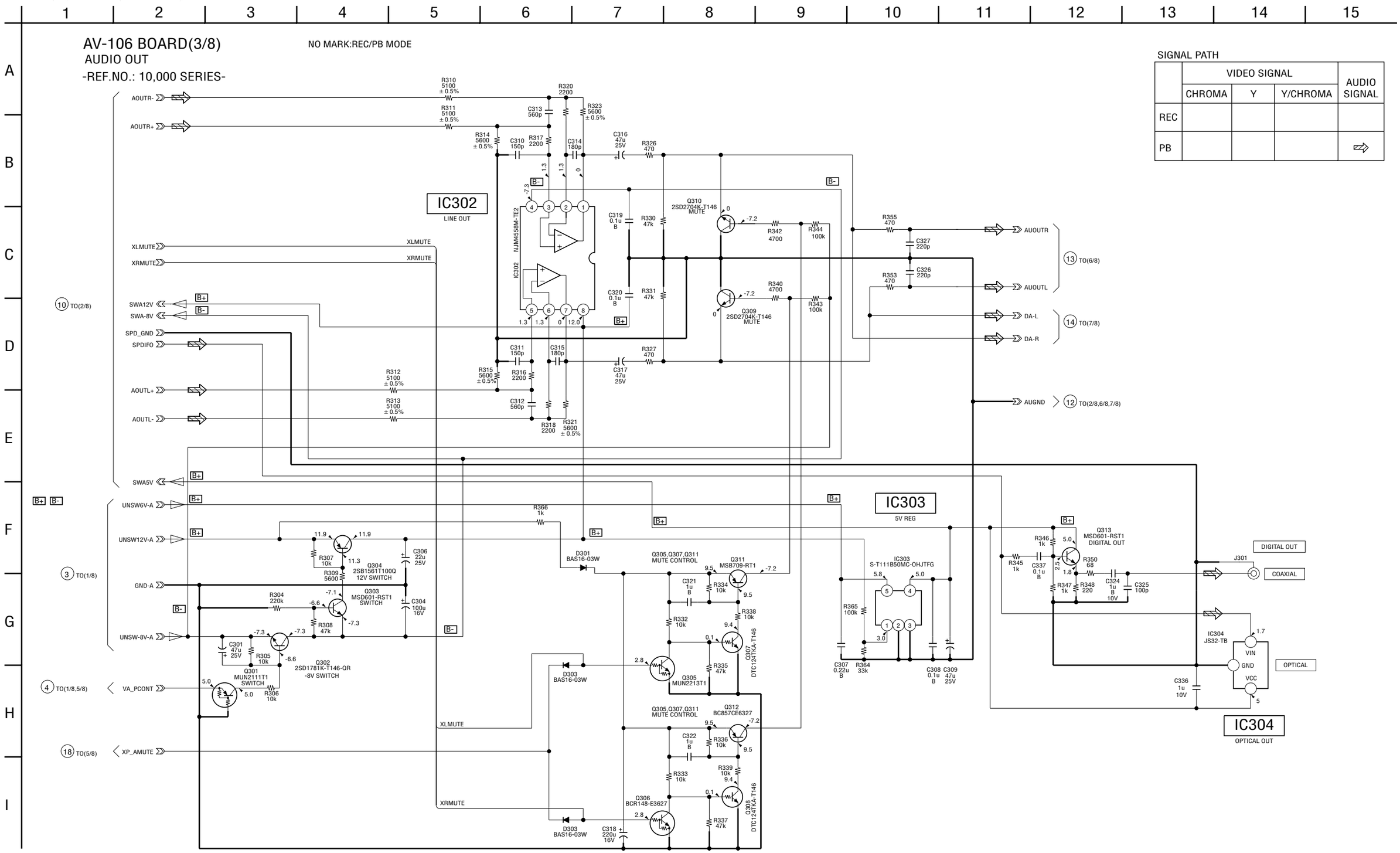
AUDIO OUT

-REF.NO.: 10,000 SERIES-

NO MARK:REC/PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB				⇨



AUDIO OUT
AV-106 (3/8)

For Schematic Diagram
- Refer to page 4-4 for waveforms.
- Refer to page 4-43 for printed wiring board.

AV-106 BOARD(4/8)
TUNER
-REF.NO.: 10,000 SERIES-

NO MARK:REC/PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB				

IC401
30V REG
IC401 TK11819MTL
4.6 V-IN
4.2 OSC
33.6 DK
T1
GND
V-OUT
32.3

TU401 (TUNER)
AERIAL
IN
OUT
5V NC NC AS NC AUDIO OUT SIF GND SCL SDA AGC 5V NC 30V GND AFT VIDEO SONY(EURO)

IC402
5V REG
IC402 PQ1MK35M2SPQ
CONT VIN GND ADJ VOUT
5.7 4.6 5.1 1.2

Q405 BC847CE6327 AGC
Q407 MUN2213T1
AUTO PRESET
Q403 MSD601-RT1 BUFFER
Q401 BC847CE6327 BUFFER

Q1402 MSD601-RST1 SIF AMP
Q1401 MSB709-RT1 SIF AMP

IC1401
EURO MSP
IC1401 MSP3417G-QG-B8V3
X1401 18.432MHz
AVSUP ANA_IN+ ANA_IN- TESTN XTAL_IN XTAL_OUT TP D_CTR_I/O_1 D_CTR_I/O_00 ADR_SEL STANDBYQ
AVSS MONO_IN VREFTOP SC1_IN_R SC1_IN_L NC NC NC AGNDC AHVSS CAPL_M
AHVSUP NC SC1_OUT_L SC1_OUT_R VREF1 NC DACM_L DACM_R VREF2 NC NC
SCL SDA TP TP TP TP TP_CO DVSUP DVSS TP RESETQ

D1401 BAS16-03W
D1400 BAS16-03W

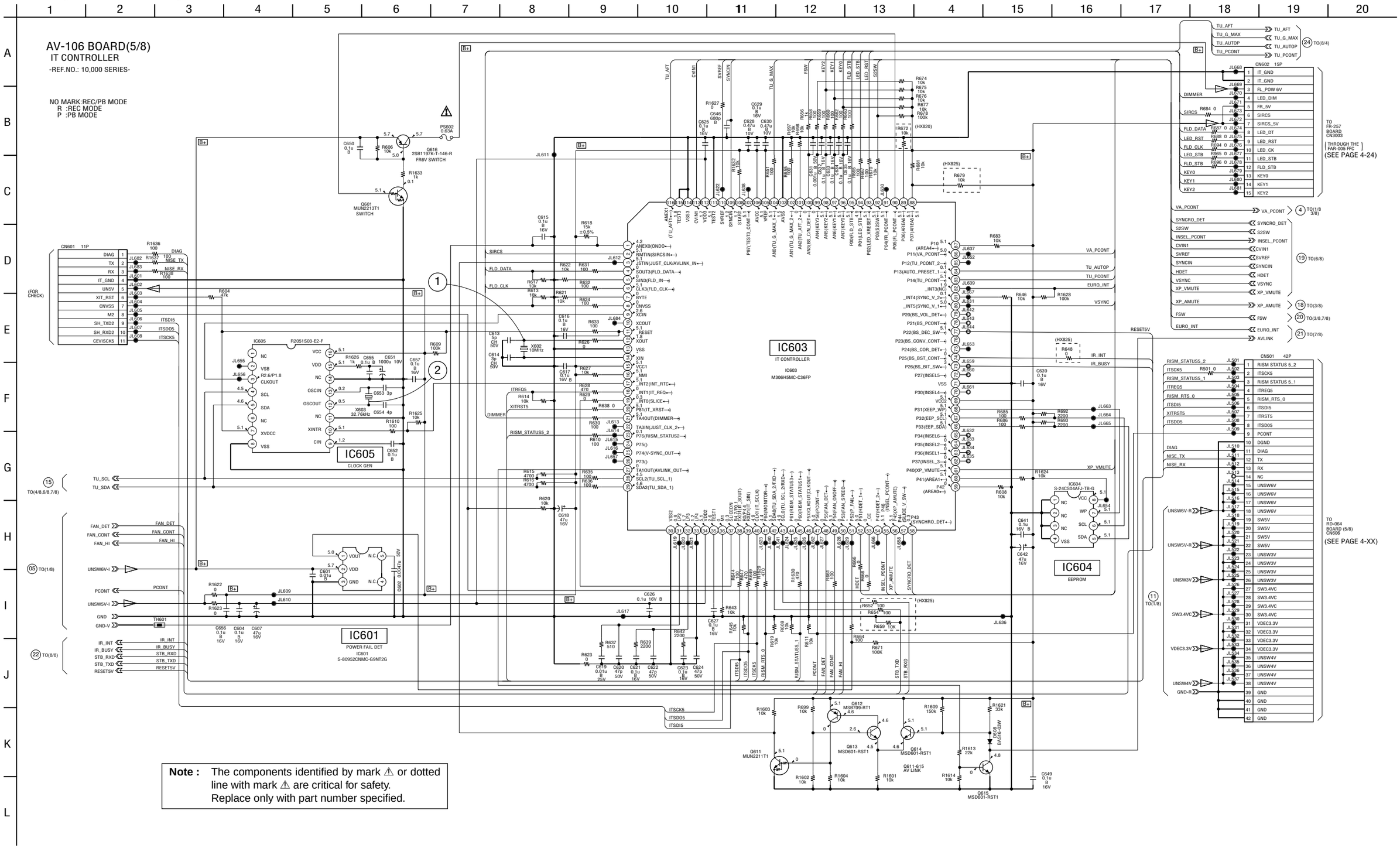
TU_AFT
TU_AUTOP
TU_G_MAX
TU_PCONT
TU_SCL
TU_SDA
TU_L
TU_R
TUDV
UNSW6V-T
GND-T
TU_VIDEO

24 TO(5/8)
15 TO(5/8, 6/8,7/8)
16 TO(7/8)
06 TO(1/8)
17 TO(6/8)

B+

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

For Schematic Diagram
- Refer to page 4-4 for waveforms.
- Refer to page 4-43 for printed wiring board.



For Schematic Diagram

- Refer to page 4-4 for waveforms.
- Refer to page 4-43 for printed wiring board.

AV-106 BOARD(6/8)

VIDEO IN/OUT

-REF.NO.: 10,000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB	⇨	⇨	⇨	⇨

IC702
VIDEO IN/OUT
IC702
LA73036M-TBA-E

IC701
-3.3V REG

Q707-711
BUFFER

(SEE PAGE 4-21)

(HXD760:Australian)

For Schematic Diagram

• Refer to page 4-43 for printed wiring board.

AV-106 BOARD(7/8)

EURO IN/OUT

-REF.NO.: 10,000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

IC801
5V REG

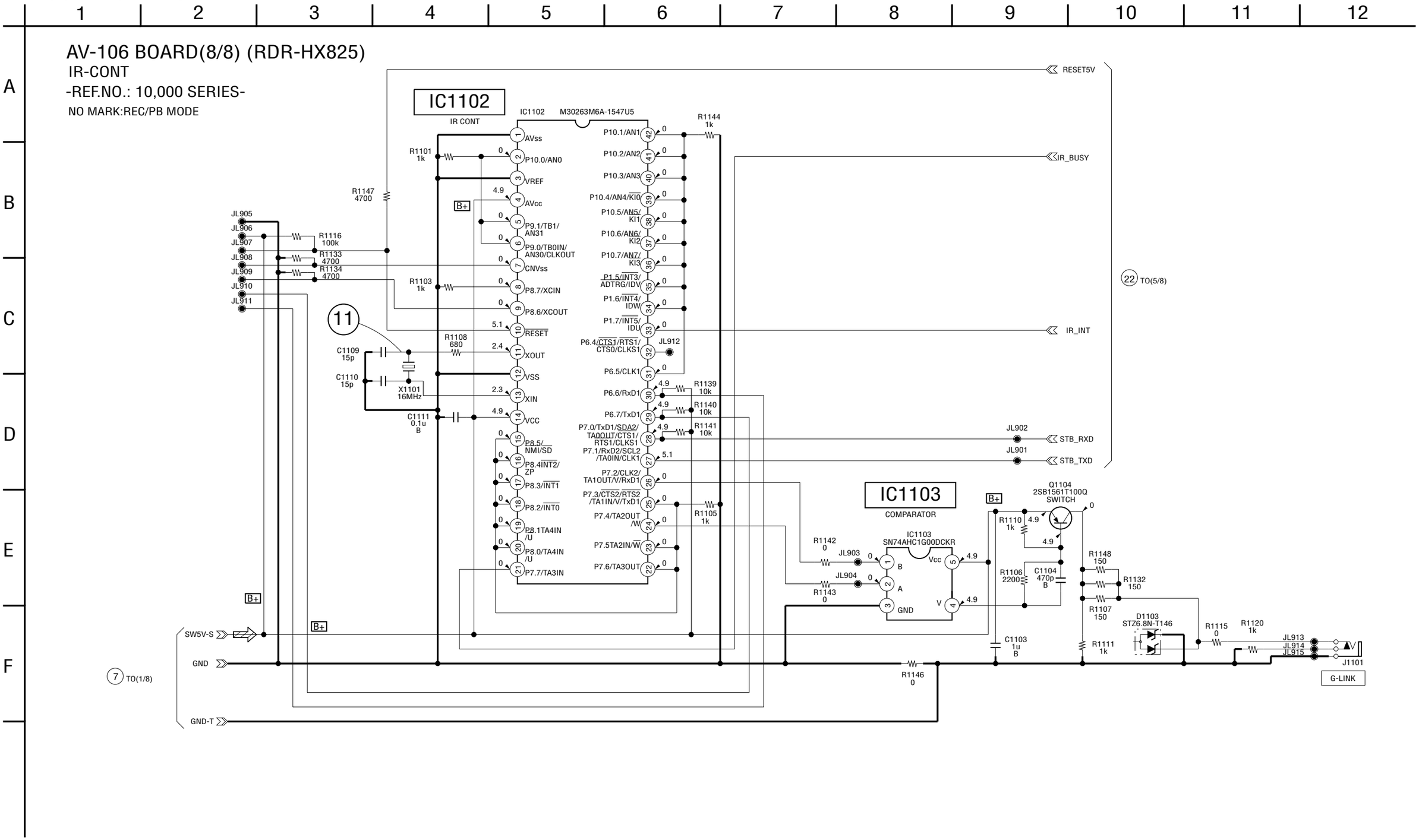
IC803
EURO VIDEO IN/OUT

IC802
EURO AUDIO IN/OUT

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB	⇨	⇨	⇨	⇨

For Schematic Diagram
- Refer to page 4-4 for waveforms.
- Refer to page 4-43 for printed wiring board.



For Schematic Diagram

• Refer to page 4-47 for printed wiring board.

FL-166 BOARD

FL DRIVER,LINE2 IN,POWER SW

-REF.NO.: 30,000 SERIES-

NO MARK:REC/PB MODE

▲: Voltage measurement of the CSP IC and the Transistors with ▲ mark,is not possible.

ND3101 (FLUORESCENT INDICATION TUBE)

IC3101
FL DRIVER
▲ PT6315 IC3101
CSP(CHIP SIZE PACKAGE) IC

CN3101 10P

10	S2 SW
9	Y2 IN
8	AN GND
7	C2 IN
6	AN GND
5	V2 IN
4	AU GND
3	L2 IN
2	AU GND
1	R2 IN

TO AV-106 BOARD (6/8) CN701 (THROUGH THE FA-118 HARNESS) (SEE PAGE 4-15)

CN3102 8P

8	KEY0
7	LED_CK
6	FLD_STB
5	LED_DT
4	IT_GND
3	FR_5V
2	IT_GND
1	FL_POW_6V

TO FR-257 BOARD CN3001 (THROUGH THE FLR-008 FFC) (SEE PAGE 4-23)

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB				

For Schematic Diagram

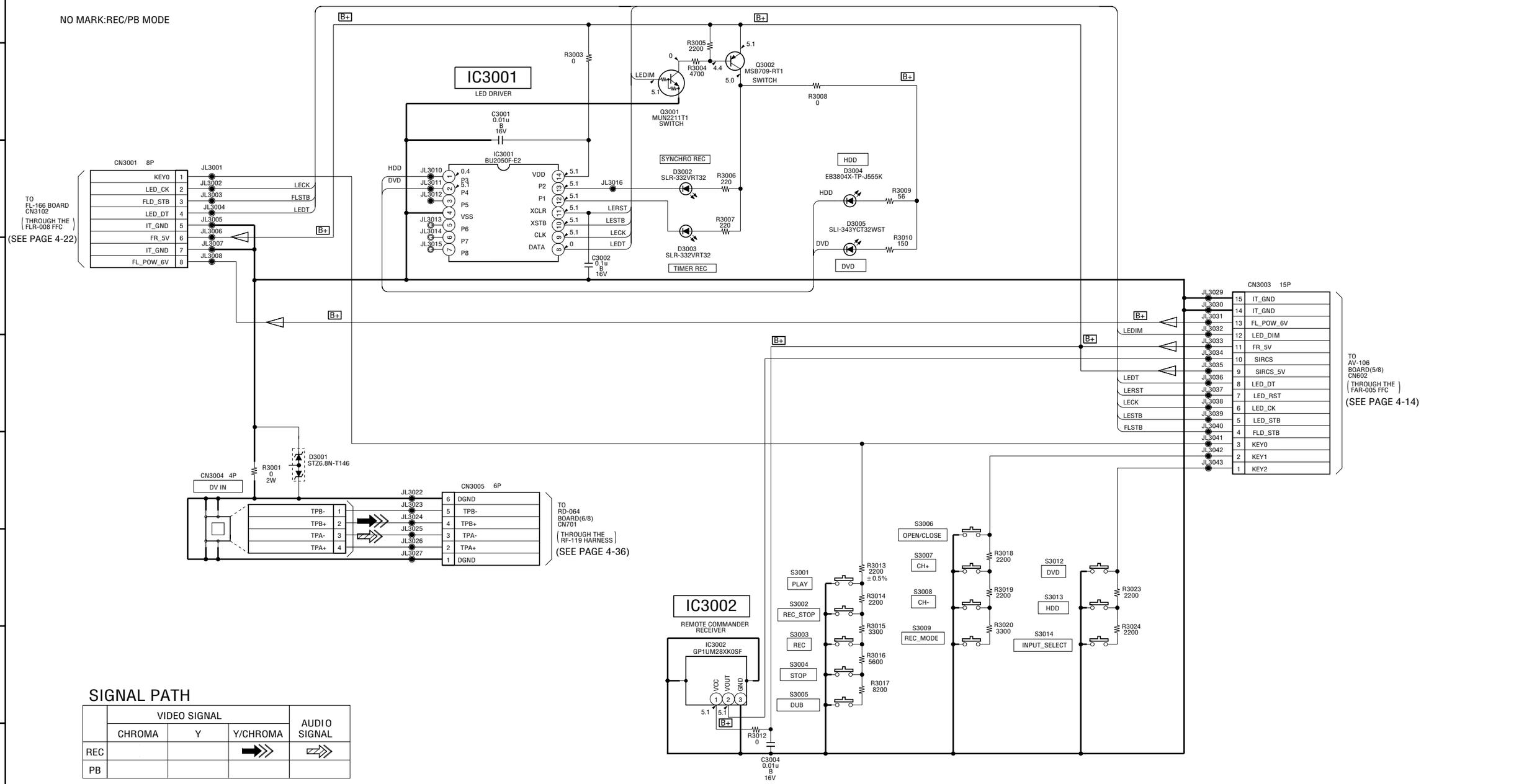
• Refer to page 4-49 for printed wiring board.

FR-257 BOARD

DV,REMOCON RECEIVER,FUNCTION SW,LED

-REF.NO.: 30,000 SERIES-

NO MARK:REC/PB MODE



SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇉
PB				

For Schematic Diagram

• Refer to page 4-51 for printed wiring board.

RD-064 BOARD(1/8)
RISM3
-REF.NO.: 20000SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

▲:Voltage measurement of the CSP IC and the Transistors with ▲mark,is not possible.

IC102 M24C32-WMN6T(B) EEPROM

IC101 RK1113CXCSCL-G 3.3V REG

IC103 RISM3 ▲ IC103 R9A34012BG CSP(CHIP SIZE PACKAGE)IC

IC105 K4H5116I3C-UC83T 512Mbit DDR SDRAM

IC106 K4H5116I3C-UC83T 512Mbit DDR SDRAM

IC108 MM1763XBE 2.5V REG

IC109 RK1113CXCSCL-G 3.3V REG

IC112 LOGIC SN74LVC2G340CKR

CN201 40P

DVD UNIT

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

For Schematic Diagram
- Refer to page 4-4 for waveforms.
- Refer to page 4-51 for printed wiring board.

RD-064 BOARD(2/8)

HDD DRIVE

NO MARK:REC/PB MODE

-REF.NO.: 20,000 SERIES-

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB			⇨	⇨

IC201
HDD DRIVE
IC201
88SA8040-TBC1C000

IC202
1.8V REG

HDD UNIT

For Schematic Diagram
• Refer to page 4-4 for waveforms.
• Refer to page 4-51 for printed wiring board.

RD-064 BOARD(3/8)

V DEC

-REF.NO.: 20,000 SERIES-

NO MARK:REC/PB MODE
R:REC MODE
P:PB MODE

IC301
V DEC
IC301
TVP5146M2PFP

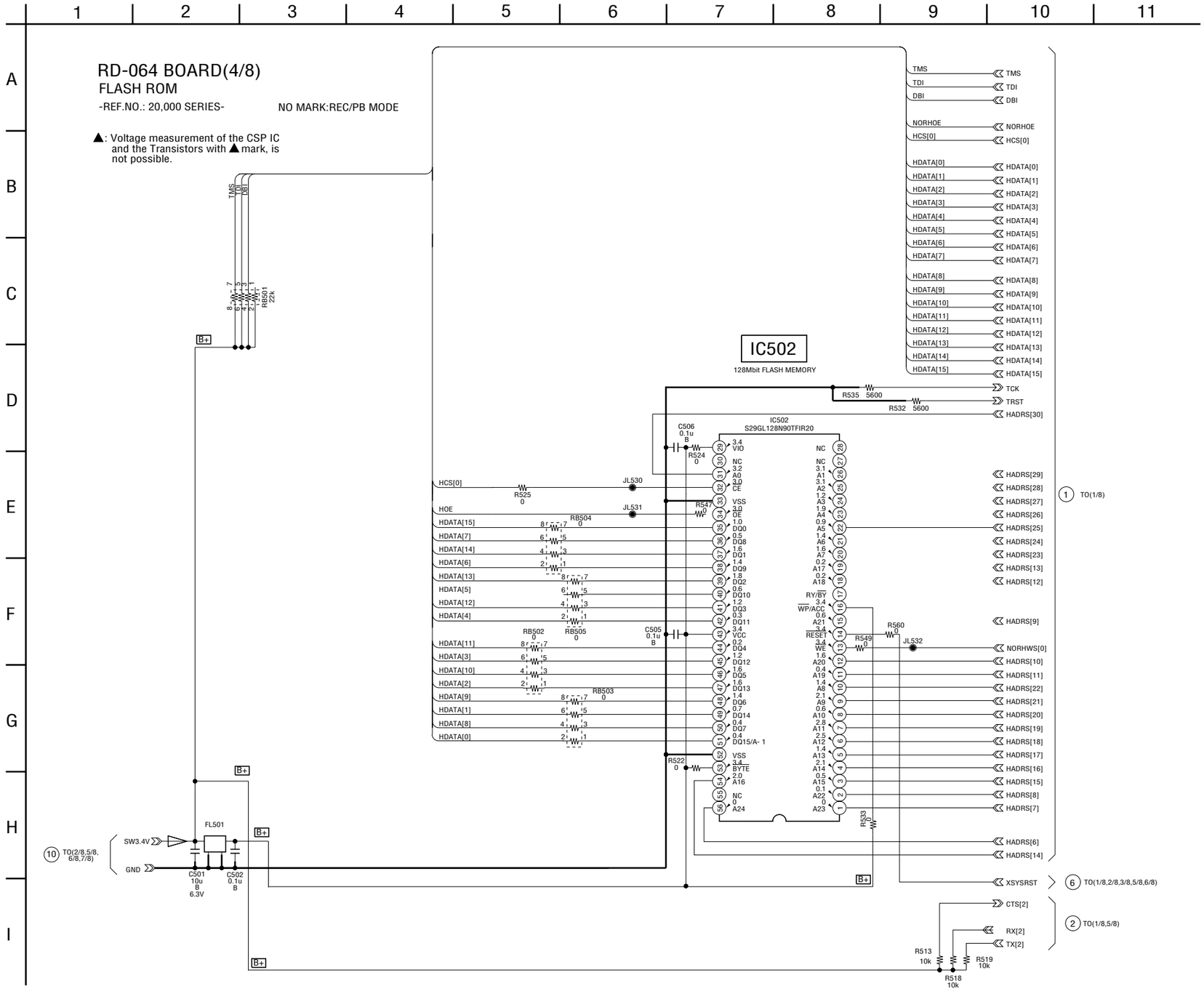
IC302
1.8V REG
IC302
BH18MA3WHFV-TR

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	➡	➡
PB			

For Schematic Diagram

• Refer to page 4-51 for printed wiring board.



FLASH ROM
RD-064 (4/8)

For Schematic Diagram

• Refer to page 4-51 for printed wiring board.

RD-064 BOARD(5/8)
AV-CN/POWER
-REF.NO.: 20,000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

IC604 SN74HCT08APWR BUFFER

IC605 SN74LV08APWR SW/BUFFER

IC601 MP2105DJ-LF-Z 1V REG

IC602 PQ1MK53K2ZPQ 3.4V REG

CN606 42P

1	RISM_STATUS2
2	IT-SCLK5
3	RISM_STATUS1
4	IT-REQ5
5	RISM-RTS[0]
6	IT-SIN5
7	IT-XRST5
8	IT-SOUT5
9	P-CONT
10	DGND
11	DIAG
12	TX[2]
13	RX[2]
14	N.C.
15	UNSW6V
16	UNSW6V
17	UNSW6V
18	UNSW6V
19	SW5V
20	SW5V
21	SW5V
22	SW5V
23	UNSW3V
24	UNSW3V
25	UNSW3V
26	UNSW3V
27	SW3.4VC
28	SW3.4VC
29	SW3.4VC
30	SW3.4VC
31	VDEC3.3V
32	VDEC3.3V
33	VDEC3.3V
34	VDEC3.3V
35	UNSW4V
36	UNSW4V
37	UNSW4V
38	UNSW4V
39	GND
40	GND
41	GND
42	GND

CN603 42P

1	SPDIFO
2	XLMUTE
3	SPD_GND
4	AUGND
5	AUGND
6	AINL+
7	AOUTR+
8	AINL-
9	AOUTR-
10	AUGND
11	AUGND
12	AUGND
13	AUGND
14	AINR+
15	AOUTL+
16	AINR-
17	AOUTL-
18	AUGND
19	XRMUTE
20	GND_V
21	SWA5V
22	FSW
23	RECVY
24	GND_V
25	VIDEO5V
26	Y
27	RECCCR
28	GND_V
29	GND_V
30	C
31	RECB/CSYNC
32	GND_V
33	GND_V
34	CR/R
35	RECG
36	GND_V
37	GND_V
38	Y/G
39	RECR
40	GND_V
41	GND_V
42	CB/B

TO AV-106 BOARD(2/8) CN502 (SEE PAGE 4-8)

TO AV-106 BOARD(5/8 CN501 (SEE PAGE 4-12)

TO(1/8,4/8)
TO(1/8,2/8, 3/8,4/8,6/8)
TO(1/8)
TO(2/8,4/8, 6/8,7/8)
TO(7/9)
TO(1/8)
TO(3/8)
TO(8/8)

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB	⇨	⇨	⇨	⇨

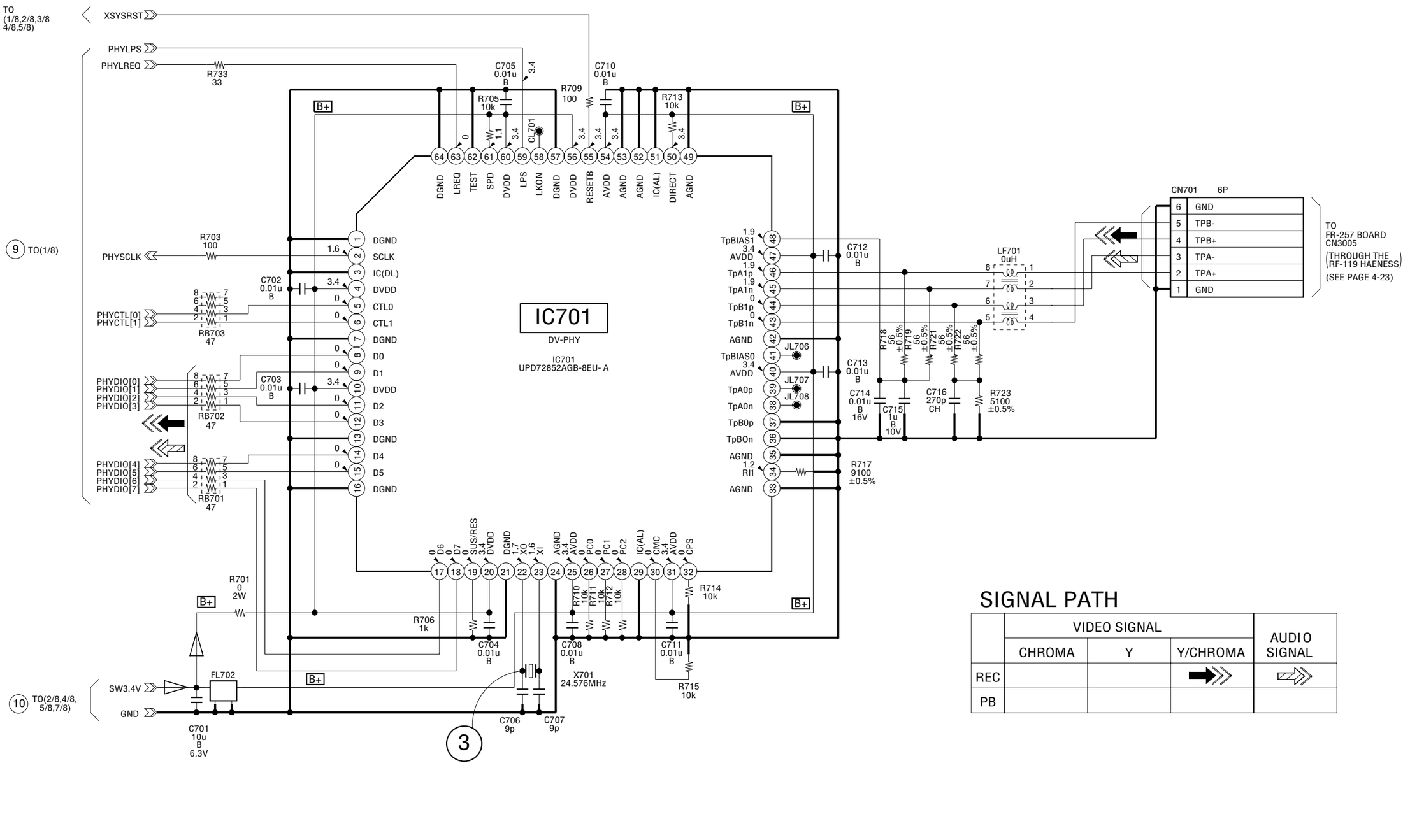
For Schematic Diagram
- Refer to page 4-4 for waveforms.
- Refer to page 4-51 for printed wiring board.

RD-064 BOARD(6/8)

DV-PHY

-REF.NO.: 20,000 SERIES-

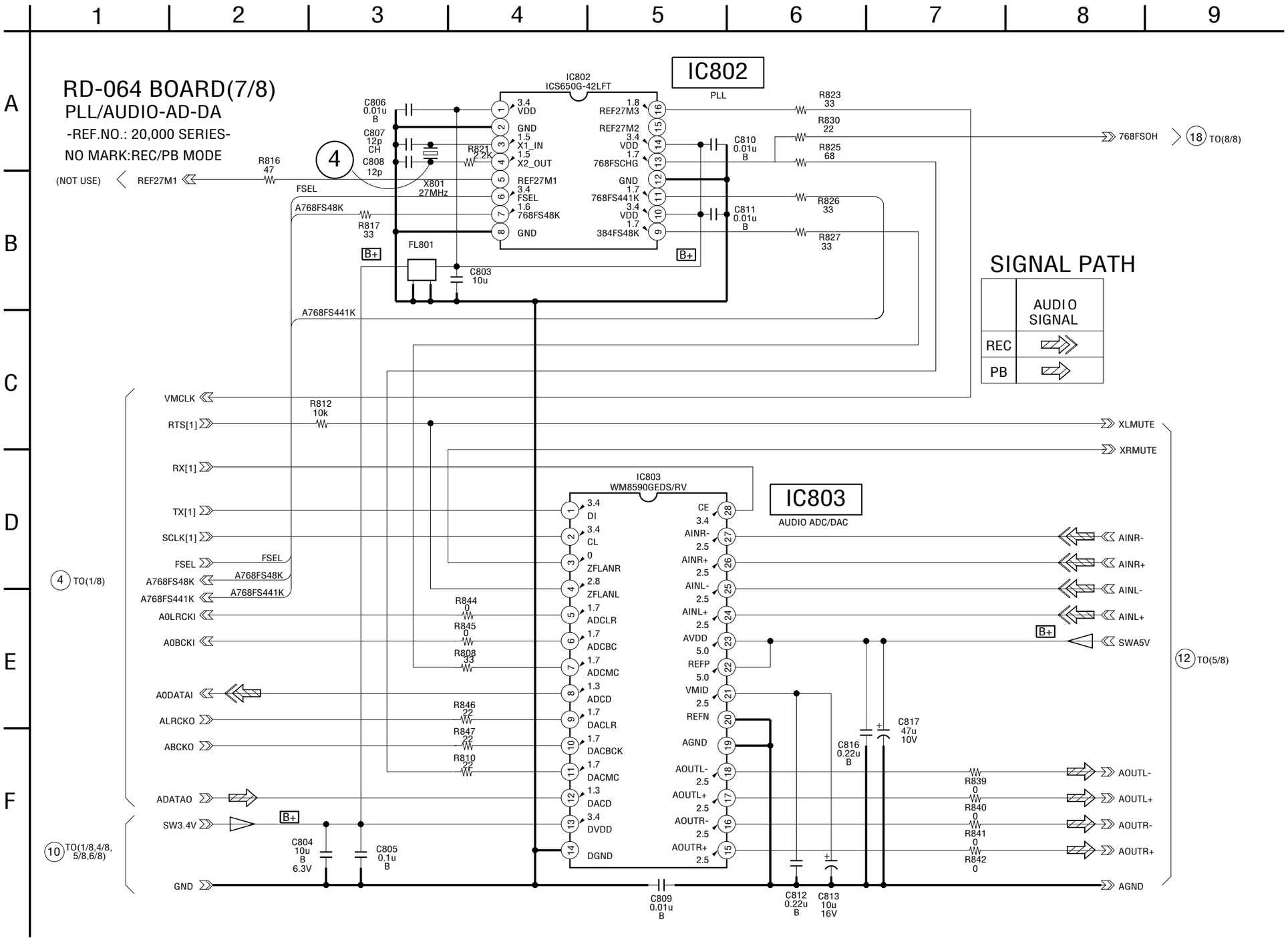
NO MARK:REC/PB MODE



SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB				

For Schematic Diagram
• Refer to page 4-4 for waveforms.
• Refer to page 4-51 for printed wiring board.



For Schematic Diagram

• Refer to page 4-51 for printed wiring board.

RD-064 BOARD(8/8)

HDMI

-REF.NO.: 20,000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

IC902 CXD9836R

IC903 MB95F108ASPFV-GE1-SG00

IC904 SI9990CY10-1.1

IC907 IC908 IC909 IC910 IC906 IC901

CN902 HDMI OUT

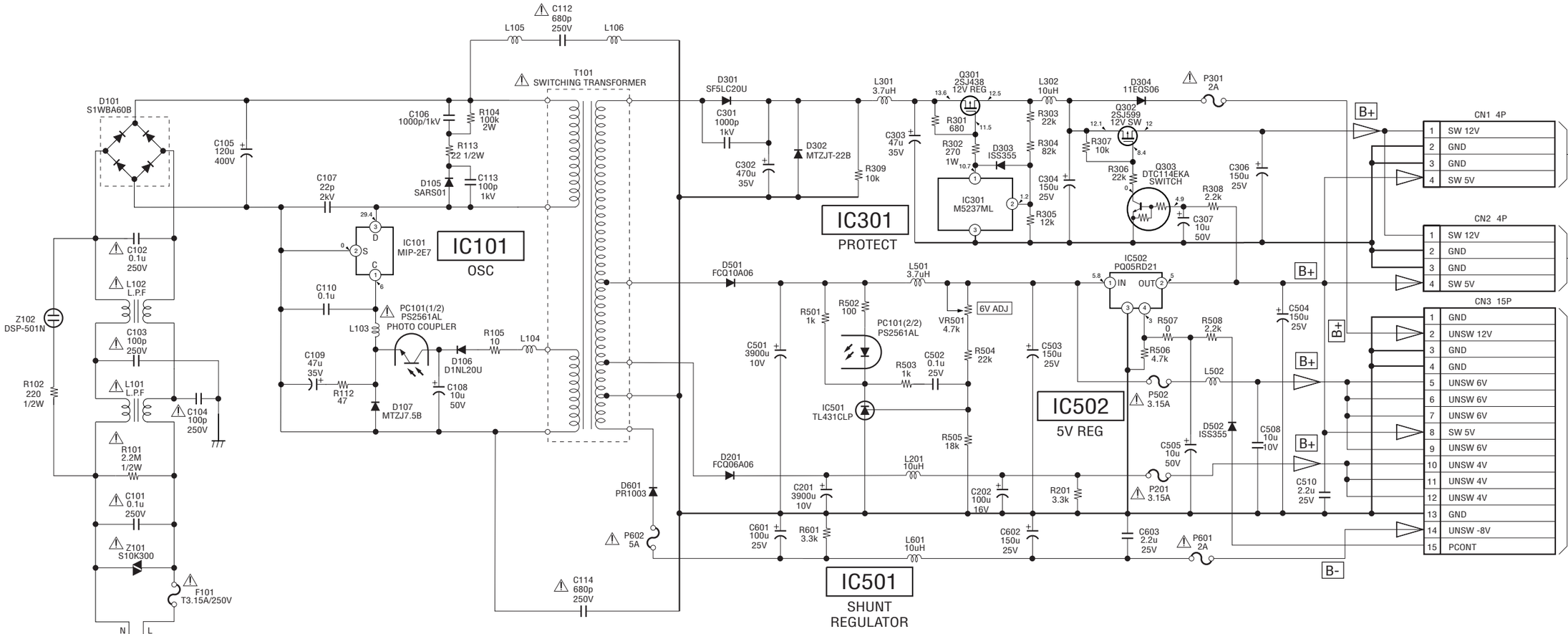
CN901 BP

NOT USE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			⇨	⇨
PB	⇨		⇨	⇨

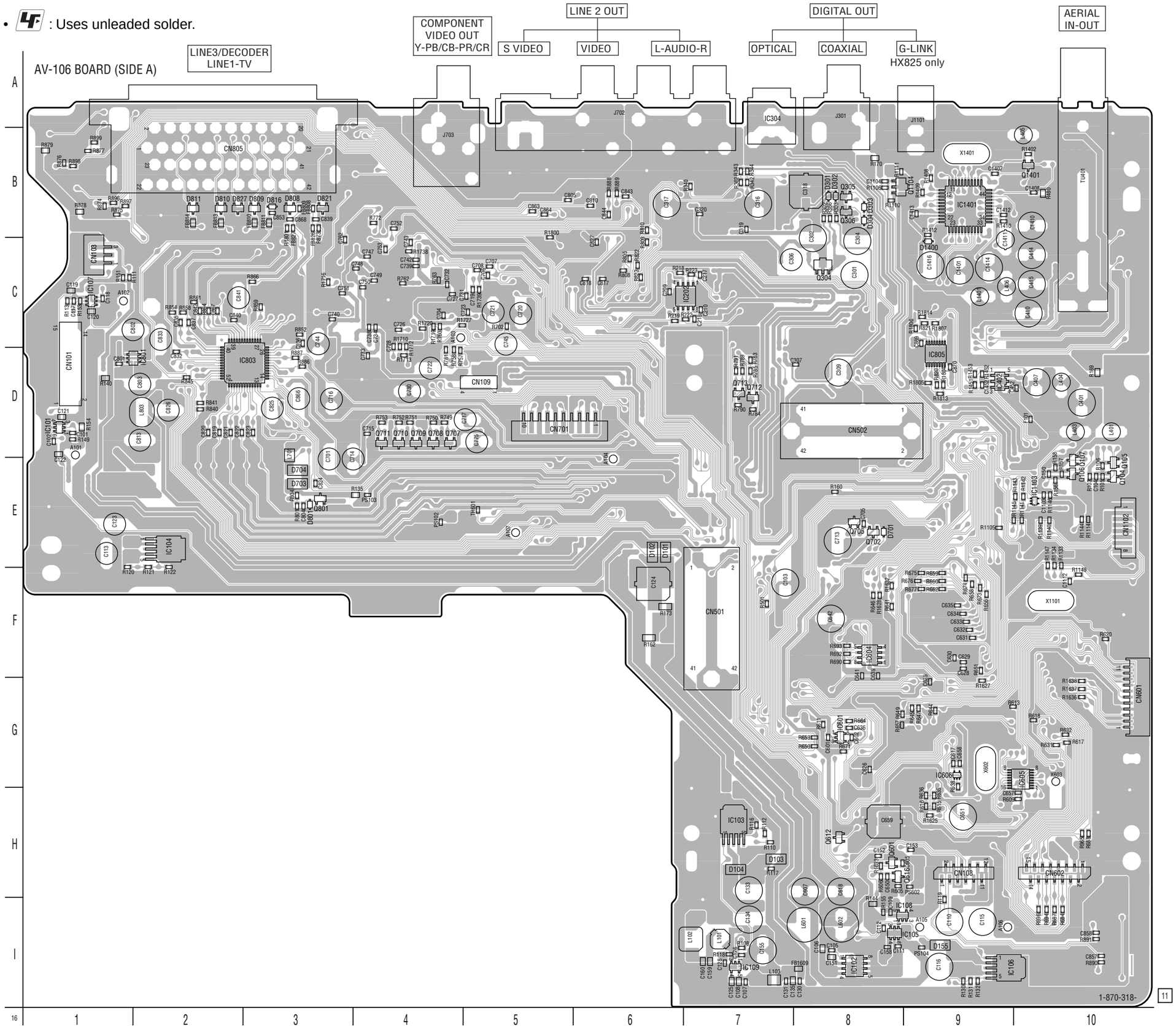
SWITCHING REGULATOR
(SRV-2001EK)



Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

4-3. PRINTED WIRING BOARDS

• : Uses unleaded solder.

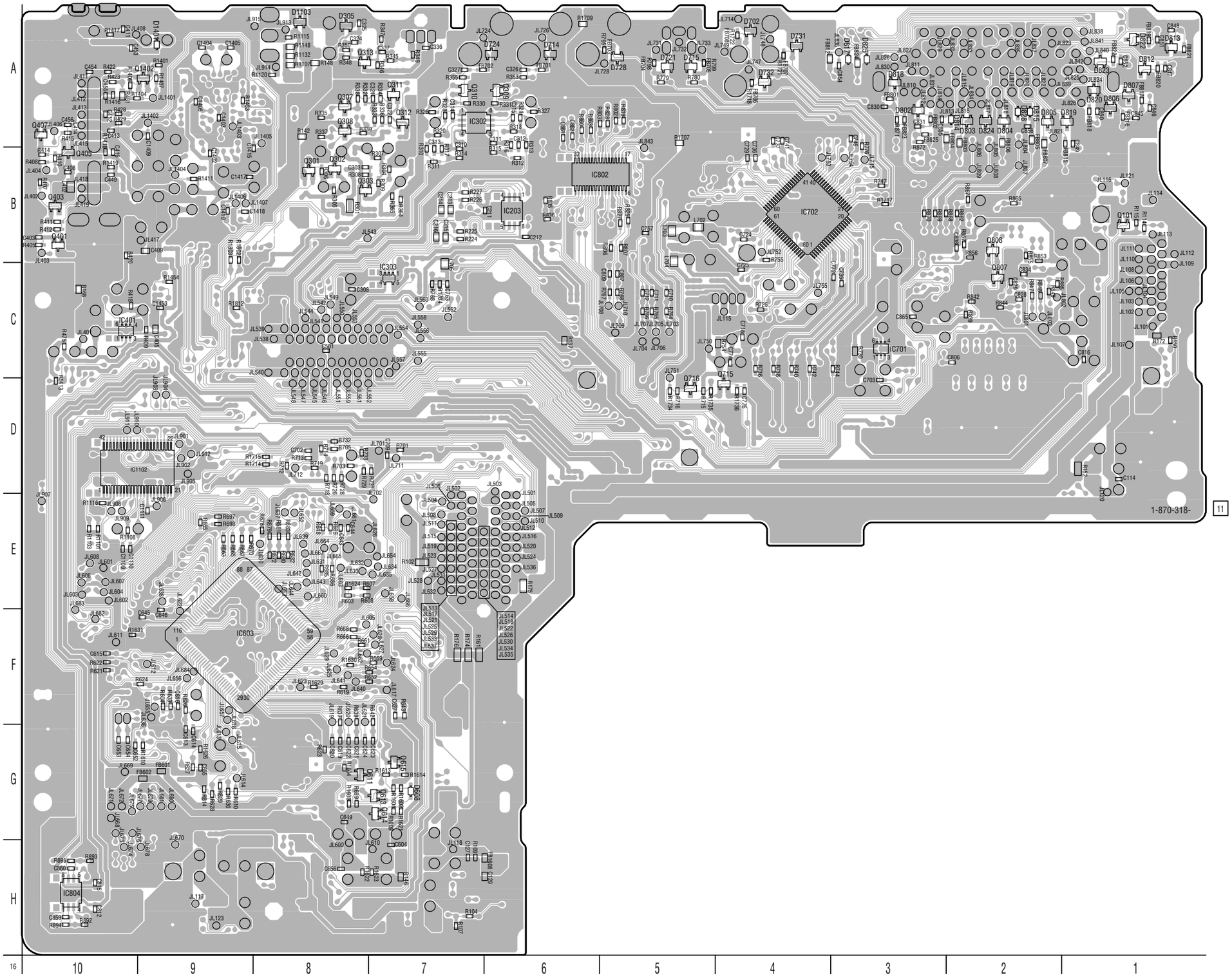


AV-106 BOARD (SIDE B)

D608	G-7
D702	A-4
D714	A-6
D715	A-5
D721	A-5
D724	A-6
D728	A-5
D731	A-4
D732	A-4
D802	A-3
D803	A-2
D804	A-2
D805	A-2
D806	A-1
D807	A-1
D812	A-1
D813	A-1
D814	A-2
D815	A-2
D817	A-3
D818	A-3
D819	A-1
D820	A-1
D822	A-1
D823	A-1
D824	A-2
D825	A-3
D828	A-2
IC203	B-6
IC302	A-7
IC303	C-7
IC401	C-10
IC603	F-9
IC701	C-3
IC702	B-4
IC802	B-5
IC804	H-10
Q101	B-1
Q301	B-8
Q302	B-8
Q303	B-8
Q307	A-8
Q308	A-8
Q309	A-6
Q310	A-7
Q311	A-7
Q312	A-7
Q313	A-8
Q611	G-8
Q613	G-7
Q614	G-7
Q615	G-7
Q715	D-4
Q716	D-5
Q807	C-2
Q808	B-2

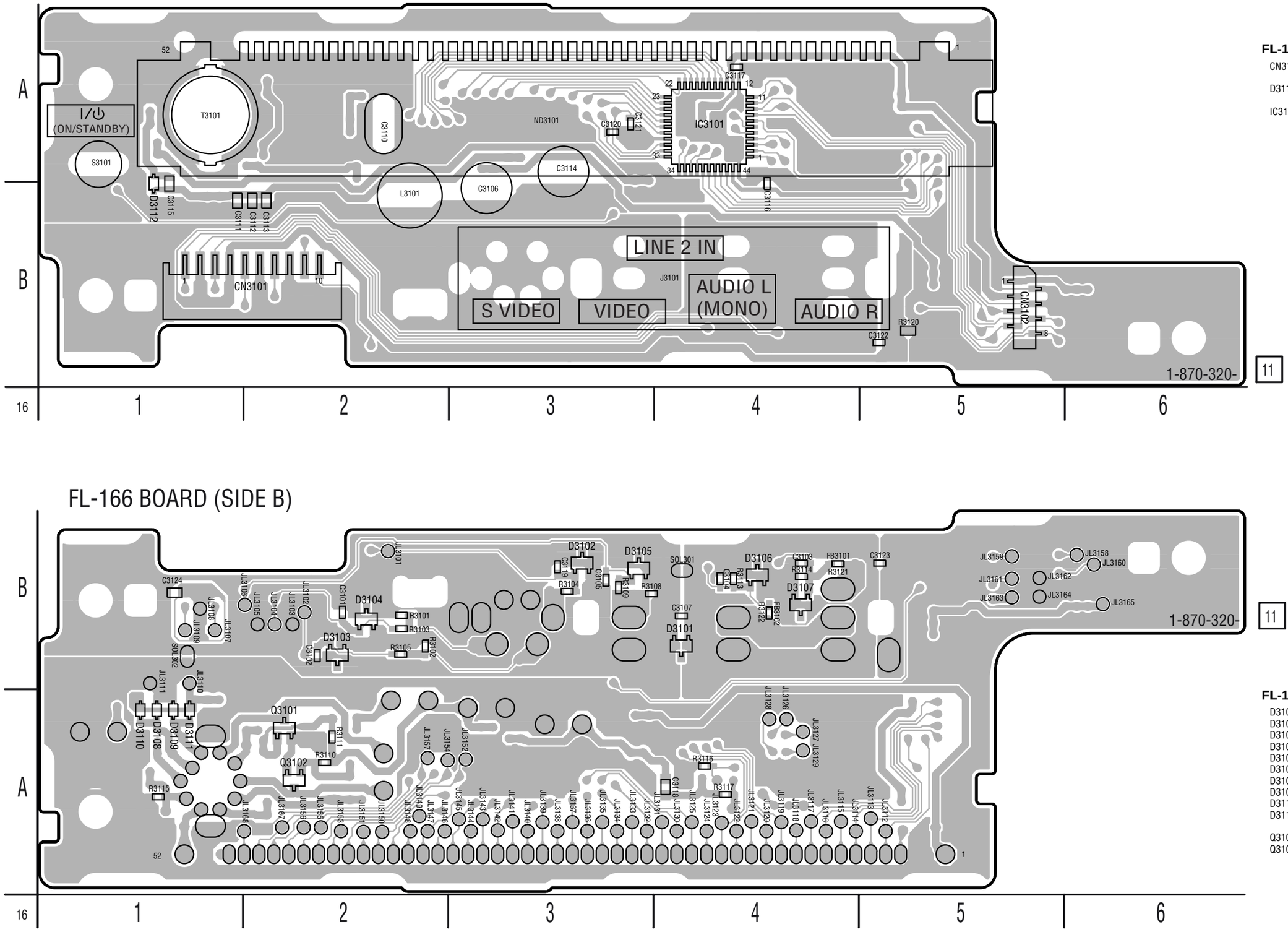
AV-106 BOARD (SIDE B)

• : Uses unleaded solder.



FL-166 BOARD (SIDE A)

• : Uses unleaded solder.



FL-166 BOARD (SIDE A)

CN3101	B-2
D3112	B-1
IC3101	A-4

FL-166 BOARD (SIDE B)

FL-166 BOARD (SIDE B)

D3102	A-3
D3103	A-2
D3104	A-2
D3105	A-3
D3106	A-4
D3107	A-4
D3108	A-1
D3109	A-1
D3110	A-1
D3111	A-1
Q3101	A-2
Q3102	A-2

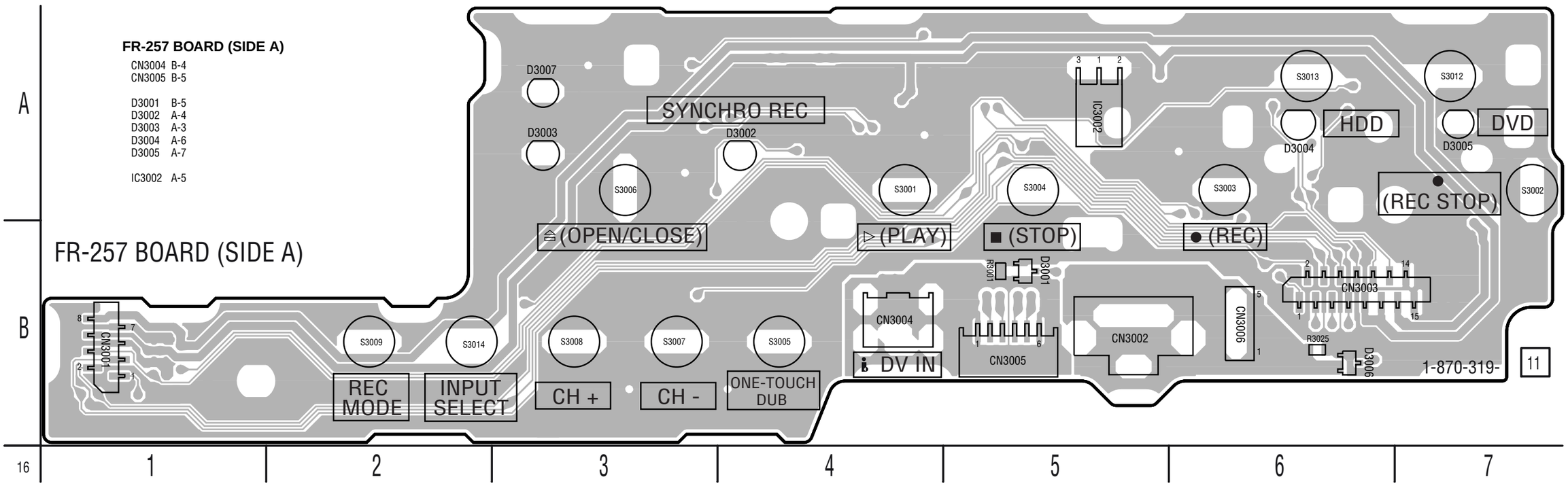
• : Uses unleaded solder.

FR-257 BOARD (SIDE A)

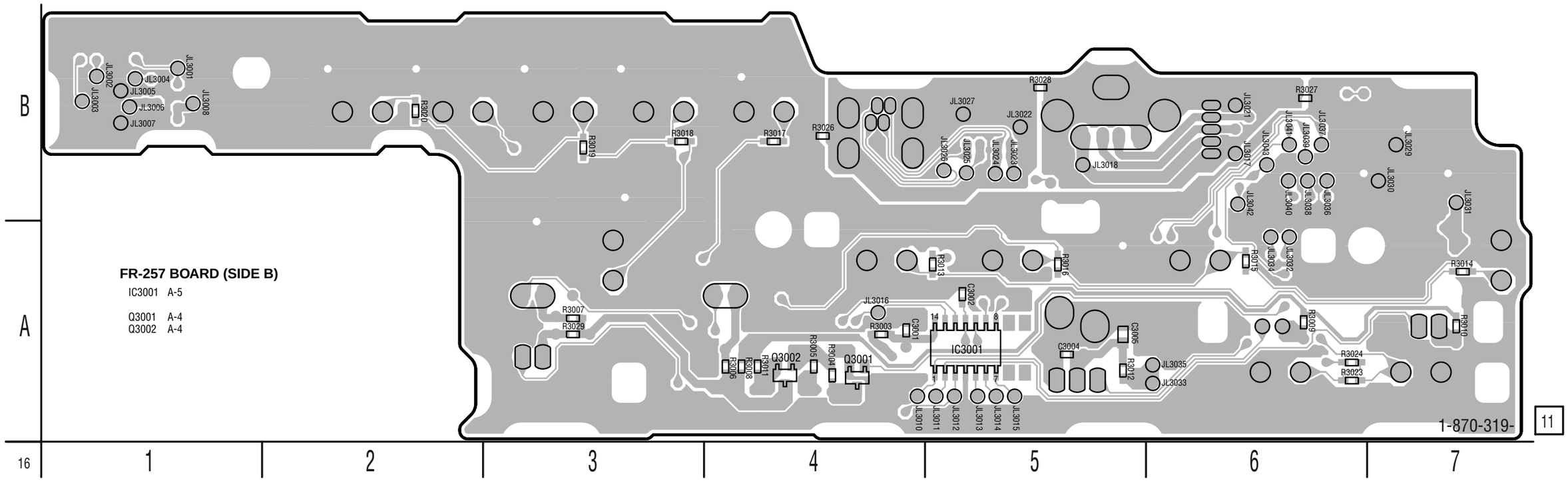
CN3004 B-4
CN3005 B-5

D3001 B-5
D3002 A-4
D3003 A-3
D3004 A-6
D3005 A-7

IC3002 A-5



FR-257 BOARD (SIDE B)



FR-257 BOARD (SIDE B)

IC3001 A-5

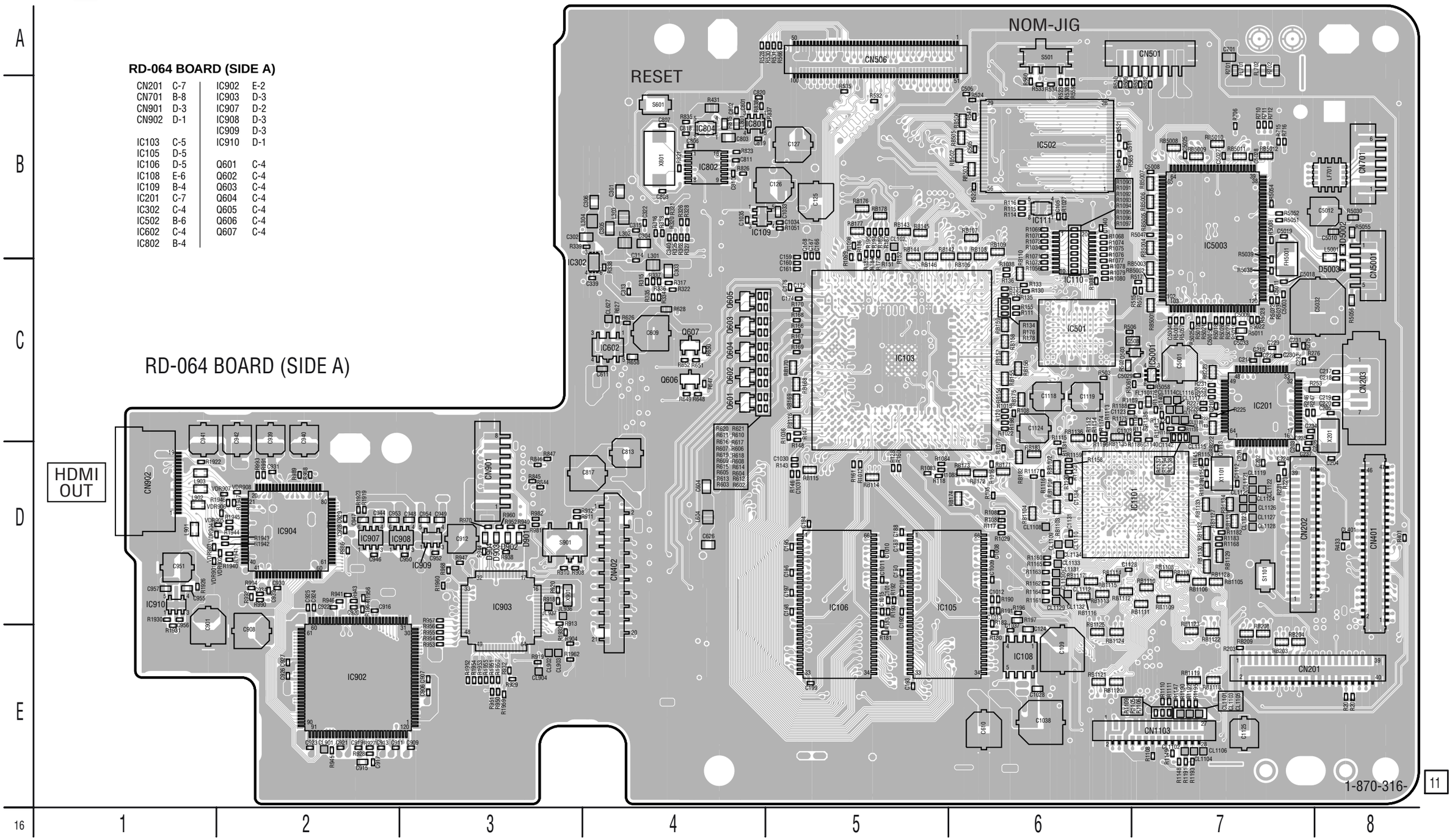
Q3001 A-4
Q3002 A-4

• : Uses unleaded solder.

RD-064 BOARD (SIDE A)

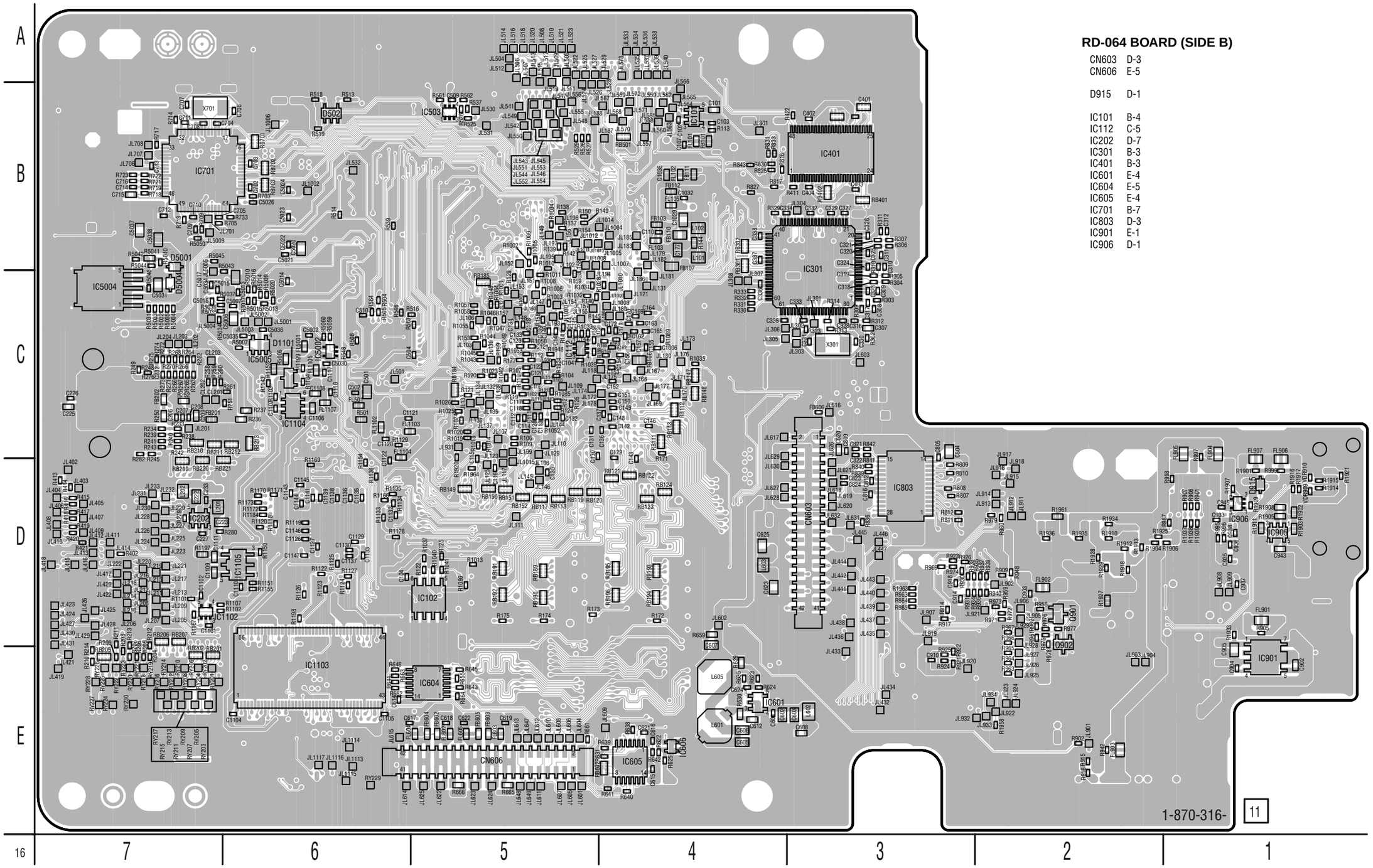
CN201	C-7	IC902	E-2
CN701	B-8	IC903	D-3
CN901	D-3	IC907	D-2
CN902	D-1	IC908	D-3
		IC909	D-3
IC103	C-5	IC910	D-1
IC105	D-5		
IC106	D-5	Q601	C-4
IC108	E-6	Q602	C-4
IC109	B-4	Q603	C-4
IC201	C-7	Q604	C-4
IC302	C-4	Q605	C-4
IC502	B-6	Q606	C-4
IC602	C-4	Q607	C-4
IC802	B-4		

RD-064 BOARD (SIDE A)



- : Uses unleaded solder.

RD-064 BOARD (SIDE B)



RD-064 BOARD (SIDE B)

CN603	D-3
CN606	E-5
D915	D-1
IC101	B-4
IC112	C-5
IC202	D-7
IC301	B-3
IC401	B-3
IC601	E-4
IC604	E-5
IC605	E-4
IC701	B-7
IC803	D-3
IC901	E-1
IC906	D-1

SECTION 5
IC PIN FUNCTION DESCRIPTION

5-1. IT CONTROL IC (IC603: M306H5MG-A14FP, M306H5MC-C36FP (AV-106 BOARD))

Pin No.	Pin Name	I/O	Function
1	ONDO	I	Detection of board temperature
2	SIRCSIN	I	Input of remote control signal
3	AVLINK-IN	I	Input of AV LINK scart signal
4	FLD_DATA	O	Output of FLD data signal
5	FLD_IN	I	Fixed at “L”
6	FLD_CLK	O	Output of FLD clock signal
7	BYTE	I	Fixed at “L”
8	CNVSS	I	Connected to GND when the flash is overwritten is VCC
9	XCIN	I	Input of sub-clock signal (32.768KHz)
10	XCOUT	O	Not used
11	_RESET	I	Input of system reset signal
12	XOUT	O	Output of main-clock signal (10MHz)
13	VSS		Digital GND
14	XIN	I	Input of main-clock signal (10MHz)
15	VCC1	—	Power supply input (Digital 5.0V)
16	_NMI	I	Fixed at “H”
17	INT_RTC	I	Input of RTC INT signal from Real Time Clock
18	_IT_REQ	I	Input of communication request signal with system controller
19	SLICE	I	Input of slicer operation detection from 37 pin
20	IT_XRST	O	Output of communication reset signal with RISM 3
21	DIMMER	O	Output of LED power supply switch
22	JUST_CLK_2	O	Not used
23	RISM_STATUS2	O	Output of communication status 2 signal with system controller
24	P75	O	Not used
25	P74	O	Not used
26	P73	O	Not used
27	AVLINK-OUT	O	Output of AV LINK signal
28	TU_SCL_1	O	Output of IIC clock signal
29	TU_SDA_1	O	Input/output IIC data signal
30	VSS2		Analog GND
31	LP2	O	Output of filter signal 2 (for Fsc)
32	LP3	O	Output of filter signal 3 (forVPS)
33	LP4	O	Output of filter signal 4 (for PDC)
34	VDD2	—	Power supply input (Analog 5V)
35	TEST1	—	Fixed at “L”
36	M1	—	Fixed at “L”
37	SLICEON	O	Output of slicer operation detection
38	IT_SOUT	O	Output of serial TXD 1 signal with system controller
39	IT_SIN	I	Input of serial RXD 1 signal with system controller
40	IT_SCLK	O	Output of serial CLK 1 signal with system controller
41	RISM_RTS_O	I	Input of RTS signal with system controller
42	IR_TXO	O	Output of serial TXD O signal wth Ir-CON (HX825 model)
43	IR_RXO	I	Input of serial RXD O signal wth Ir-CON (HX825 model)
44	ATT_XDTT_SEL	O	Not used
45	RISM_STATUS1	I	Input of communication status 1 signal with system controller
46	CLKOUT	—	Digital GND
47	PCONT	O	Output of system power control switching signal
48	FAN_DET	I	Input of fan stopping detect signal
49	FAN_ONOFF	O	Output of fan on/off signal (“H”:fan on)
50	FAN_SPEED	O	Output of fan direction speed switching signal (“H”:high speed)

Pin No.	Pin Name	I/O	Function
51	P_FAIL	I	Input of UNSW6V power off detection signal
52	HDET_1	I	Detection of IN SEL output video signal
53	CE	I	Fixed at “L” (when the flash is overwritten is VCC)
54	NC	O	Not used
55	INSEL_PCONT	O	Output of IC’s power supply signal (“H”:INSEL)
56	XP_AMUTE	O	Output of muting signal for audio
57	NC	O	Not used
58	SYNCHRO_DET	I	Detection of selection signal from component video signal
59	AREA0	I	Fixed at “L” (Input of area detection signal 0)
60	AREA1	I	Fixed at “H” (Input of area detection signal 1)
61	XP_VMUTE	O	Output of muting signal for video
62	INSEL_3	O	Not used
63	INSEL1	O	Not used
64	INSEL2	O	Not used
65	INSEL6	O	Not used
66	EEP_SDA	O	Output of IIC data signal with EEPROM
67	EEP_SCL	O	Output of IIC clock signal with EEPROM
68	XEEP_WP	O	Output of IIC writing protect signal with EEPROM
69	VCC2	—	Power supply input (Digital 5V)
70	INSEL4	O	Not used
71	VSS		Digital GND
72	INSEL5	O	Not used
73	IR_BUSY	I	Input of busy signal for IR control IC (HX825 model)
74	IR_INT	O	Output of INT signal for IR control IC (HX825 model)
75	NC	O	Not used
76	DTT_PCONT	O	Not used
77	IT_RESET	O	Output of reset signal for IR control IC (HX825 model)
78	NC	O	Not used
79	NC	O	Not used
80	SYNC_V_1	I	Input of vertical synchronous signal
81	SYNC_V_2	I	Fixed at “L”
82	NC (_INT3)	I	Input of sacrt IC’s interpolate signal
83	TU_PCONT	O	Output of tuner power supply control signal (“H”:Power on)
84	AUTO_PRESET_1	O	Output of RF gain control signal
85	NC	O	Not used
86	VA_PCONT	O	Output of power control signal for audio/video
87	AREA4	I	Fixed at “H” or “L”. Input of area detection signal 4
88	AREA5	I	Fixed at “H”. Input of area detection signal 5
89	AREA6	I	Fixed at “H” or “L”. Input of area detection signal 6
90	FL_PCONT	O	Output of FLD grid power on signal
91	NC	O	Not used
92	S2SW	I	Detection of line 2 S-video signal
93	LED_XRESET	O	Output of reset signal for LED and FLD driver ICs
94	LED_STB	O	Output of strove signal for LED driver
95	FLD_STB	O	Output of strove signal for FLD driver
96	KEY0	I	Input of switching signal 0
97	KEY1	I	Input of switching signal 1
98	KEY2	I	Input of switching signal 2
99	KEY3	I	Fixed at “H”
100	BS_C/N_DET	I	Input of blanking signal for EURO scart
101	TU_AFT_2	I	Fixed at “L”
102	TU_G_MAX_2	I	Fixed at “L”
103	AVSS		Analog GND

Pin No.	Pin Name	I/O	Function
104	TU_G_MAX_1	I	Input of tuner gain control signal
105	VREF	I	Power supply input (Analog 5V)
106	AVCC	I	Power supply input (Analog 5V)
107	NC	O	Not used
108	START	I	Input of oscillation selection signal
109	SYNCIN	I	Input composite video signal
110	SVREF	I	When slice the vertical synchronous signal input slice power
111	TEST2	I	Fixed at GND
112	VDD3	—	Power supply input (Analog 5V)
113	CVIN1	I	Input of component video signal
114	VSS3		Analog GND
115	TEST3	I	Fixed at “GND”
116	TU_AFT1	I	Input of tuner AFT1 control signal

5-2. MAIN CONTROL IC (IC103: R8A34012BG (RD-064 BOARD))

Pin No.	Pin Name	I/O	Function
A1	AT1DATA[11]	I/O	Input/output of data 11 for DVD
A2	AT1DATA[12]	I/O	Input/output of data 12 for DVD
A3	AT1DATA[14]	I/O	Input/output of data 14 for DVD
A4	AT1DIOW	O	Output of DVD write signal
A5	AT1INTRQ	I	Input of IRQ signal
A6	HDREQ[0]	—	Fixed at “L”
A7	HWS[0]	O	Output of write strove signal 0
A8	HCS[1]	—	Fixed at “H”
A9	HCS[4]	—	Fixed at “H”
A10	HADRS[30]	O	Output of address 30
A11	HADRS[26]	O	Output of address 26
A12	HADRS[22]	O	Output of address 22
A13	HADRS[21]	O	Output of address 21
A14	HADRS[17]	O	Output of address 17
A15	HADRS[13]	O	Output of address 13
A16	HADRS[10]	O	Output of address 10
A17	HADRS[7]	O	Output of address 7
A18	MSDATA[0]	—	Fixed at “L”
A19	MSDATA[3]	—	Fixed at “L”
A20	SCLK[3]	O	Output of SCK signal for HDMI sub-CPU
A21	CTS[1]	O	Output of DTT control signal “XDTT_OE”
A22	TX[2]	O	Output of UART(CSIO)/GPIO
A23	RTS[1]	O	Output of UART(CSIO)/GPIO
A24	RTS[0]	O	Output of UART(CSIO)/GPIO
A25	DVDD	—	Power supply input (Digital 1.0V)
AA1	TRDATA[1]	O	Not used
AA2	TRDATA[3]	O	Not used
AA3	TRSYNC	O	Not used
AA4	EVENT[0]	O	Not used
AA5	VDD33	—	Power supply input (Digital 3.4V)
AA6	VRMA	—	Fixed at “L”
AA7	VRMB	—	Fixed at “L”
AA8	VSSDAD10		Analog GND
AA9	REXT1	—	Fixed at “L”
AA10	REXT2	—	Fixed at “L”
AA11	VDD33	—	Power supply input (Digital 3.4V)
AA12	VDD	—	Power supply input (Digital 1.0V)
AA13	VSS		Digital GND
AA14	VDD	—	Power supply input (Digital 1.0V)
AA15	VSS		Digital GND
AA16	VDD33	—	Power supply input (Digital 3.4V)
AA17	VDD	—	Power supply input (Digital 1.0V)
AA18	DADRS[3]	O	Output of address 3 for SDRAM
AA19	DADRS[10]	O	Output of address 10 for SDRAM
AA20	VDD	—	Power supply input (Digital 1.0V)
AA21	DDATA[8]	I/O	Input/output of data 8 for SDRAM
AA22	VDD25	—	Power supply input (Digital 2.5V)
AA23	DDATA[10]	I/O	Input/output of data 10 for SDRAM
AA24	DDATA[3]	I/O	Input/output of data 3 for SDRAM
AA25	DDATA[4]	I/O	Input/output of data 4 for SDRAM
AB1	TRDATA[4]	O	Not used
AB2	TRDATA[7]	O	Not used
AB3	TRST	I	Fixed at “L”

Pin No.	Pin Name	I/O	Function
AB4	VCCAAD10A	—	Power supply input (Analog 3.3V)(ADC)
AB5	VROA	—	Fixed at “L”
AB6	VROB	—	Fixed at “L”
AB7	VCCAAD10B	—	Power supply input (Analog 3.3V)(ADC)
AB8	VCCADA10	—	Power supply input (Analog 3.3V)(DAC)
AB9	VCCADA10	—	Power supply input (Analog 3.3V)(DAC)
AB10	VCCADA10	—	Power supply input (Analog 3.3V)(DAC)
AB11	VSS		Digital GND
AB12	TESTMOD[5]	O	Fixed at “L”
AB13	REC656V	I	Input of vertical synchronization signal
AB14	REC656O[1]	O	Not used
AB15	REC656O[3]	O	Not used
AB16	PXCLK	O	Not used
AB17	REC656O[7]	O	Not used
AB18	DADRS[5]	O	Output of address 5 for SDRAM
AB19	VDD25	—	Power supply input (Digital 2.5V)(I/O)
AB20	DADRS[7]	O	Output of address 7 for SDRAM
AB21	DADRS[9]	O	Output of address 9 for SDRAM
AB22	DADRS[12]	O	Output of address 12 for SDRAM
AB23	VSS		Digital GND
AB24	DDATA[1]	I/O	Input/output of data 1 for SDRAM
AB25	DDATA[2]	I/O	Input/output of data 2 for SDRAM
AC1	TRDATA[5]	O	Not used
AC2	TCK	I	Fixed at “L”
AC3	TDO	O	Not used
AC4	VRPA	—	Fixed at “L”
AC5	VRPB	—	Fixed at “L”
AC6	VSSAAD10B		Analog GND
AC7	VCCDAD10	—	Power supply input (Digital 3.3V)(ADC)
AC8	VSSDDA10A		Digital GND
AC9	VDDDDA10	—	Power supply input (Digital 1.0V)
AC10	VSSDDA10B		Digital GND
AC11	TESTMOD[1]	O	Digital GND
AC12	TESTMOD[6]	O	Digital GND
AC13	REC656H	I	Input of horizontal synchronization signal
AC14	REC656I[1]	I	Input of digital video signal [1]
AC15	REC656O[2]	O	Not used
AC16	REC656O[4]	O	Not used
AC17	REC656I[7]	I	Input of digital video signal [7]
AC18	DADRS[4]	O	Output of address 4 for SDRAM
AC19	DADRS[6]	O	Output of address 6 for SDRAM
AC21	DADRS[8]	O	Output of address 8 for SDRAM
AC20	VSS		Digital GND
AC22	DADRS[11]	O	Output of address 11 for SDRAM
AC23	DWE	O	Output of write enable signal for SDRAM
AC24	VDD25	—	Power supply input (Digital 2.5V)
AC25	DDATA[0]	I/O	Input/output of data 0 for SDRAM
AD1	EVENT[1]	O	Not used
AD2	VINA1	I	Input of analog video (CVBS)
AD3	VSSAAD10A		Analog GND
AD4	NC		Not used
AD5	VCCAAD10B	—	Power supply input (Analog 3.3V)(DAC)
AD6	ROUT(PD0)	O	Output of analog video signal (red)

Pin No.	Pin Name	I/O	Function
AD7	VSSADA10		Analog GND
AD8	BOUT(PD2)	O	Output of analog video signal (blue)
AD9	VSSADA10		Analog GND
AD10	COUT(PD3)	O	Output of analog video signal (chroma)
AD11	TESTMOD[2]	—	Digital GND
AD12	TESTMOD[7]	—	Digital GND
AD13	TMS	I	Fixed at “H”
AD14	REC656O[0]	O	Not used
AD15	REC656I[2]	I	Input of digital video signal [2]
AD16	REC656I[4]	I	Input of digital video signal [4]
AD17	REC656O[5]	O	Not used
AD18	REC656O[6]	O	Not used
AD19	DADRS[1]	O	Output of address 1 for SDRAM
AD20	DBA[1]	O	Output of bank address 1 for SDRAM
AD21	VDD25	—	Power supply input (Analog 2.5V)
AD22	DCS	O	Output of chip select signal for SDRAM
AD23	DCAS	O	Output of CAS signal for SDRAM
AD24	DCLKO	O	Output of clock signal for SDRAM
AD25	VSS		Digital GND
AE1	TD1	I	Not used
AE2	VSSAAD10A		Analog GND
AE3	VINA2	I	Input of analog video signal (Y)
AE4	VCCAAD10A	—	Power supply input (Analog 3.3V)(DAC)
AE5	CIN (VINB1)	I	Input of analog video signal (C)
AE6	VSSAAD10B		Analog GND
AE7	GOUT(PD1)	O	Output of analog video signal (green)
AE8	VSSADA10		Analog GND (DAC)
AE9	YOUT(PD4)	O	Output of analog video signal (Y)
AE10	TESTMOD[0]	—	Digital GND
AE11	TESTMOD[3]	—	Digital GND
AE12	TESTMOD[4]	—	Digital GND
AE13	RESET	I	Input of hardware reset signal
AE14	REC656I[0]	I	Input of digital video signal [0]
AE15	R656CLKI	I	Input of clock signal
AE16	REC656I[3]	I	Input of digital video signal [3]
AE17	REC656I[5]	I	Input of digital video signal [5]
AE18	REC656I[6]	I	Input of digital video signal [6]
AE19	DADRS[2]	O	Output of address 2 for SDRAM
AE20	DADRS[0]	O	Output of address 0 for SDRAM
AE21	DBA[0]	O	Output of bank address 0 for SDRAM
AE22	VSS		Digital GND
AE23	DRAS	O	Output of RAS signal for SDRAM
AE24	DCLKNO	O	Output of negative clock signal for SDRAM
AE25	DVREF	I	Input of reference voltage
B1	AT1DATA[4]	I/O	Input/output of data 4 for DVD
B2	AT1DATA[3]	I/O	Input/output of data 3 for DVD
B3	AT1DATA[1]	I/O	Input/output of data 1 for DVD
B4	AT1DMARQ	I	Input of request signal from DMA
B5	AT1DMACK	I	Input of ACK signal from DMA
B6	AT1ADR[2]	O	Output of devise address 2 for DVD
B7	HDACK[1]	O	Output of ROM change signal for Debug
B8	HOE	O	Output of output enable signal
B9	HCS[2]	O	Output of chip select signal for HDMI DL mode

Pin No.	Pin Name	I/O	Function
B10	HADRS[31]	O	Output of address 31
B11	HADRS[27]	O	Output of address 27
B12	HADRS[23]	O	Output of address 23
B13	HADRS[20]	O	Output of address 20
B14	HADRS[16]	O	Output of address 16
B15	HADRS[12]	O	Output of address 12
B16	HADRS[8]	O	Output of address 8
B17	MSBS	—	Fixed at “L”
B18	MSDATA[2]	—	Fixed at “L”
B19	MSCLK	—	Fixed at “L”
B20	SCLK[0]	O	Output of UART(CSIO)/GPIO
B21	TX[1]	O	Output of UART(CSIO)/GPIO
B22	RTS[2]	O	Output of CS control signal for HDMI sub-CPU
B23	DVSS		Digital GND
B24	PCO	O	Not used
B25	AHVDD	—	Power supply input (Analog 3.3V)
C1	AT1DATA[5]	I/O	Input/output of data 5 for DVD
C2	AT1DATA[10]	I/O	Input/output of data 10 for DVD
C3	AT1DATA[13]	I/O	Input/output of data 13 for DVD
C4	AT1DATA[15]	I/O	Input/output of data 15 for DVD
C5	AT1IORDY	I	Input of I/O ready signal
C6	AT1ADR[0]	O	Output of devise address 0 for DVD
C7	AT1CS[0]	O	Output of chip select signal 0 for DVD
C8	HDACK[0]	O	Output of transfer acknowledge signal/GPIO 0
C9	HCS[0]	O	Output of chip select signal 0
C10	HCS[5]	O	Output of chip select signal/GPIO 5
C11	HADRS[28]	O	Output of address 28
C12	HADRS[24]	O	Output of address 24
C13	HADRS[19]	O	Output of address 19
C14	HADRS[15]	O	Output of address 15
C15	HADRS[11]	O	Output of address 11
C16	HADRS[6]	O	Output of address 6
C17	MSDATA[1]	—	Fixed at “L”
C18	CTS[3]	O	Output of UART(CSIO)/GPIO
C19	SCLK[1]	O	Output of UART(CSIO)/GPIO
C20	CTS[0]	O	Output of UART(CSIO)/GPIO
C21	RTS[3]	O	Output of XSMRDY for HDMI sub-CPU
C22	RX[2]	O	Output of UART(CSIO)/GPIO
C23	AHVSS		Digital GND
C24	RX[1]	O	Output of UART(CSIO)/GPIO
C25	HDATA[15]	I/O	Input/output of data 15
D1	AT1DATA[6]	I/O	Input/output of data 6 for DVD
D2	AT1DATA[9]	I/O	Input/output of data 9 for DVD
D3	AT1DATA[2]	I/O	Input/output of data 2 for DVD
D4	AT1DATA[0]	I/O	Input/output of data 0 for DVD
D5	AT1DIOR	O	Output of I/O read signal
D6	AT1ADR[1]	O	Output of devise address 1 for DVD
D7	AT1CS[1]	O	Output of chip select signal 1 for DVD
D8	HDREQ[1]	O	Output of reset signal for HDMI sub-CPU
D9	HWS[1]	O	Fixed at “H”
D10	HCS[3]	—	Fixed at “H”
D11	HADRS[29]	O	Output of address 29
D12	HADRS[25]	O	Output of address 25

Pin No.	Pin Name	I/O	Function
D13	HADRS[18]	O	Output of address 18
D14	HADRS[14]	O	Output of address 14
D15	HADRS[9]	O	Output of address 9
D16	MSINS	—	Fixed at “L”
D17	SCLK[2]	O	Output of reset signal for HDMI sub-CPU
D18	CTS[2]	O	Output of UART(CSIO)/GPIO
D19	TX[0]	O	Output of UART(CSIO)/GPIO
D20	TX[3]	I	Input of IO HDMI sub-CPU SI signal
D21	RX[3]	I	Input of IO HDMI sub-CPU SO signal
D22	VMCLK	I	Input of 27MHz system clock
D23	RX[0]	O	Output of UART(CSIO)/GPIO
D24	HDATA[13]	I/O	Input/output of data 13
D25	HDATA[10]	I/O	Input/output of data 10
E1	AT2CS[1]	O	Output of chip select signal for HDD driver
E2	AT1RESET	O	Output of reset signal for DVD
E3	AT1DATA[7]	I/O	Input/output of data 7 for DVD
E4	AT1DATA[8]	I/O	Input/output of data 8 for DVD
E5	VDD	—	Power supply input (Digital 1.0V)
E6	VSS		Digital GND
E7	VDD	—	Power supply input (Digital 1.0V)
E8	VDD33	—	Power supply input (Digital 3.3V)
E9	VSS		Digital GND
E10	VDD	—	Power supply input (Digital 1.0V)
E11	VSS		Digital GND
E12	VDD33	—	Power supply input (Digital 3.3V)
E13	VDD	—	Power supply input (Digital 1.0V)
E14	VSS		Digital GND
E15	VDD	—	Power supply input (Digital 1.0V)
E16	VSS		Digital GND
E17	VDD33	—	Power supply input (Digital 3.3V)
E18	VDD	—	Power supply input (Digital 1.0V)
E19	VSS		Digital GND
E20	VDD	—	Power supply input (Digital 1.0V)
E21	VDD33	—	Power supply input (Digital 3.3V)
E22	HDATA[14]	I/O	Input/output of data 14
E23	HDATA[12]	I/O	Input/output of data 12
E24	HDATA[9]	I/O	Input/output of data 9
E25	HDATA[8]	I/O	Input/output of data 8
F1	AT2ADR[1]	O	Output of device address 1 for HDD driver
F2	AT2ADR[0]	O	Output of device address 0 for HDD driver
F3	AT2ADR[2]	O	Output of device address 2 for HDD driver
F4	AT2CS[0]	O	Output of chip select signal for HDD driver
F5	VSS		Digital GND
F21	VDD	—	Power supply input (Digital 1.0V)
F22	HDATA[11]	I/O	Input/output of data 11
F23	TEST	—	Fixed at GND
F24	HDATA[7]	I/O	Input/output of data 7
F25	HDATA[5]	I/O	Input/output of data 5
G1	AT2DIOR	O	Output of I/O read signal
G2	AT2IORDY	I	Input of I/O ready signal
G3	AT2DMACK	O	Output of ACK signal from DMA
G4	AT2INTRQ	I	Input of IRQ signal
G5	VDD33	—	Power supply input (Digital 3.3V)

Pin No.	Pin Name	I/O	Function
G21	VSS		Digital GND
G22	CSYNC	—	Fixed at “H”
G23	HDATA[6]	I/O	Input/output of data 6
G24	HDATA[3]	I/O	Input/output of data 3
G25	HDATA[2]	I/O	Input/output of data 2
H1	AT2DATA[0]	I/O	Input/output of data 0 for HDD driver
H2	AT2DATA[15]	I/O	Input/output of data 15 for HDD driver
H3	AT2DMARQ	I	Input of request signal from DMA
H4	AT2DIOW	O	Output of I/O write signal
H5	VDD	—	Power supply input (Digital 1.0V)
H21	VDD	—	Power supply input (Digital 1.0V)
H22	HDATA[4]	I/O	Input/output of data 4
H23	HDATA[1]	I/O	Input/output of data 1
H24	HDATA[0]	I/O	Input/output of data 0
H25	FSEL (INT[7])	O	Output of interrupt request/GPIO
J1	AT2DATA[2]	I/O	Input/output of data 2 for HDD driver
J2	AT2DATA[13]	I/O	Input/output of data 13 for HDD driver
J3	AT2DATA[1]	I/O	Input/output of data 1 for HDD driver
J4	AT2DATA[14]	I/O	Input/output of data 14 for HDD driver
J5	VSS		Digital GND
J21	VDD33	—	Power supply input (Digital 3.3V)
J22	INT[8]	—	Not used
J23	DBI	I	Input of SDI-ICE/JTAG TRST
J24	INT[6]	—	Fixed at “L”
J25	INT[5]	I	Input for DTT “IRQ” signal
K1	AT2DATA[4]	I/O	Input/output of data 4 for HDD driver
K2	AT2DATA[11]	I/O	Input/output of data 11 for HDD driver
K3	AT2DATA[3]	I/O	Input/output of data 3 for HDD driver
K4	AT2DATA[12]	I/O	Input/output of data 12 for HDD driver
K5	VDD	—	Power supply input (Digital 1.0V)
K21	VSS		Digital GND
K22	INT4	—	Fixed at “H”
K23	WP(INT3)	O	Output of IIC writing protect signal with EEPROM
K24	SDA[1]	O	Output of data signal 1 for EPROM
K25	SDA[0]	I/O	Input/output transmission data 0 for EEPROM
L1	AT2DATA[6]	I/O	Input/output of data 6 for HDD driver
L2	AT2DATA[9]	I/O	Input/output of data 9 for HDD driver
L3	AT2DATA[5]	I/O	Input/output of data 5 for HDD driver
L4	AT2DATA[10]	I/O	Input/output of data 10 for HDD driver
L5	VDD33	—	Power supply input (Digital 3.3V)
L11	VSS		Digital GND
L12	VSS		Digital GND
L13	VSS		Digital GND
L14	VSS		Digital GND
L15	VSS		Digital GND
L21	SDCL[0]	O	Output of transmission clock 0 for EEPROM
L22	SDCL[1]	O	Output of clock signal for EEPROM
L23	INT[2]	I	Input of interrupt request signal for HDMI
L24	INT[1]	I	Fixed at “H”
L25	INT[0]		Not used
M1	AT2RESET	O	Output of reset signal for HDD
M2	A1BCKI	I	Fixed at “H”
M3	AT2DATA[7]	I/O	Input/output of data 7 for HDD driver

Pin No.	Pin Name	I/O	Function
M4	AT2DATA[8]	I/O	Input/output of data 8 for HDD driver
M5	VSS		Digital GND
M11	VSS		Digital GND
M12	VSS		Digital GND
M13	VSS		Digital GND
M14	VSS		Digital GND
M15	VSS		Digital GND
M21	VDD	—	Power supply input (Digital 1.0V)
M22	DDATA[30]	I/O	Input/output of data 30 for SDRAM
M23	DDATA[31]	I/O	Input/output of data 31 for SDRAM
M24	VDD25	—	Power supply input (Digital 2.5V)
M25	HWAIT	—	Fixed at “H”
N1	A1DATAI	I	Fixed at “H”
N2	AMCLK1	I	Input of audio master clock (36.864MHz)
N3	A1LRCKI	I	Fixed at “H”
N4	ADATAO	O	Output of digital audio signal
N5	VDD	—	Power supply input (Digital 1.0V)
N11	VSS		Digital GND
N12	VSS		Digital GND
N13	VSS		Digital GND
N14	VSS		Digital GND
N15	VSS		Digital GND
N21	DDATA[21]	I/O	Input/output of data 21 for SDRAM
N22	DDATA[28]	I/O	Input/output of data 28 for SDRAM
N23	DDATA[29]	I/O	Input/output of data 29 for SDRAM
N24	DDATA[22]	I/O	Input/output of data 22 for SDRAM
N25	DDATA[23]	I/O	Input/output of data 23 for SDRAM
P1	ADCCLKO	O	Not used
P2	LRCKO	O	Output of audio L/R clock signal
P3	AODATAI	I	Input of digital audio signal
P4	AOBCKI	I	Input of audio bit clock signal
P5	VDD33	—	Power supply input (Digital 3.3V)
P11	VSS		Digital GND
P12	VSS		Digital GND
P13	VSS		Digital GND
P14	VSS		Digital GND
P15	VSS		Digital GND
P21	DDATA[18]	I/O	Input/output of data 18 for SDRAM
P22	DDATA[26]	I/O	Input/output of data 26 for SDRAM
P23	DDATA[27]	I/O	Input/output of data 27 for SDRAM
P24	DDATA[19]	I/O	Input/output of data 19 for SDRAM
P25	DDATA[20]	I/O	Input/output of data 20 for SDRAM
R1	SPDIFO	O	Output of digital audio signal
R2	VCLKI	I	Input of clock signal (27MHz) (Video decoder)
R3	BCKO	O	Output of audio bit clock signal
R4	AMCLK2	I	Input of audio master clock (33.8688MHz)
R5	VDD	—	Power supply input (Digital 1.0V)
R11	VSS		Digital GND
R12	VSS		Digital GND
R13	VSS		Digital GND
R14	VSS		Digital GND
R15	VSS		Digital GND
R21	DDATA[25]	I/O	Input/output of data 25 for SDRAM

Pin No.	Pin Name	I/O	Function
R22	VDD25	—	Power supply input (Digital 2.5V)
R23	VSS		Digital GND
R24	DDATA[16]	I/O	Input/output of data 16 for SDRAM
R25	DDATA[17]	I/O	Input/output of data 17 for SDRAM
T1	AOLRCKI	I	Input of audio L/R clock signal
T2	DACCLKO	O	Not used
T3	SPDIFI	I	Fixed at “H”
T4	PHYDIO[7]	I	Input of data 7 for PHY
T5	VSS		Digital GND
T21	DDM[2]	O	Output of data mask signal 2 for SDRAM
T22	DDQS[3]	O	Output of data strobe signal 3 for SDRAM
T23	DDATA[24]	I/O	Input/output of data 24 for SDRAM
T24	VDD25	—	Power supply input (Digital 2.5V)
T25	VSS		Digital GND
U1	PHYLREQ	O	
U2	PHYDIO[6]	I	Input of data 6 for PHY
U3	PHYDIO[4]	I	Input of data 4 for PHY
U4	PHYDIO[1]	I	Input of data 1 for PHY
U5	VDD	—	Power supply input (Digital 1.0V)
U21	DDM[1]	O	Output of data mask signal 1 for SDRAM
U22	DDQS[1]	O	Output of data strobe signal 1 for SDRAM
U23	DDM[3]	O	Output of data mask signal 3 for SDRAM
U24	DDM[0]	O	Output of data mask signal 0 for SDRAM
U25	DDQS[2]	O	Output of data strobe signal 2 for SDRAM
V1	PHYDIO[5]	I	Input of data 5 for PHY
V2	PHYDIO[3]	I	Input of data 3 for PHY
V3	PHYDIO[0]	I	Input of data 0 for PHY
V4	PHYCTL[1]	O	Not used
V5	VDD33	—	Power supply input (Analog 3.3V)(DAC)
V21	VDD	—	Power supply input (Digital 1.0V)
V22	VDD25	—	Power supply input (Digital 2.5V)
V23	DDATA[15]	I/O	Input/output of data 15 for SDRAM
V24	DDATA[7]	I/O	Input/output of data 7 for SDRAM
V25	DDQS[0]	O	Output of data strobe signal 0
W1	PHYDIO[2]	I	Input of data 2 for PHY
W2	PHYLPS	O	
W3	PHYSCLK	I	Input of clock signal
W4	TRDATA[2]	O	Not used
W5	VSS		Digital GND
W21	DDATA[14]	I/O	Input/output of data 14 for SDRAM
W22	DDATA[13]	I/O	Input/output of data 13 for SDRAM
W23	VSS		Digital GND
W24	VDD25	—	Power supply input (Digital 2.5V)
W25	DDATA[6]	I/O	Input/output data 6 for SDRAM
Y1	PHYCTL[0]	O	
Y2	TRDATA[0]	O	Not used
Y3	TRCLK	O	Not used
Y4	TRDATA[6]	O	Not used
Y5	VDD	—	Power supply input (Digital 1.0V)
Y21	DDATA[9]	I/O	Input/output of data 9 for SDRAM
Y22	DDATA[11]	I/O	Input/output of data 11 for SDRAM
Y23	DDATA[12]	I/O	Input/output of data 12 for SDRAM
Y24	DDATA[5]	I/O	Input/output of data 5 for SDRAM

Pin No.	Pin Name	I/O	Function
Y25	VSS		Digital GND

SECTION 6
SERVICE MODE

This is the diagnostics to locate cause of fault.
The diagnostics can be executed using the remote commander and a monitor.
To enter the service mode, connect the VIDEO OUT connector of the main unit to the monitor. While pressing the "⏏" (Open/Close) button and the "▷" (PLAY) button at the same time, connect the AC power cord to the power outlet. (Keep pressing the above buttons until a message, "WELCOME" appears on the display panel of the main unit.)
While the diagnostics is in progress, either "OK" or "NG" appears on the monitor screen to enable the judgment whether the respective devices or the peripheral are normal or have any abnormality.
When an abnormality is detected, the diagnostics is stopped at that moment and you can select to keep running the diagnostics or to stop it.

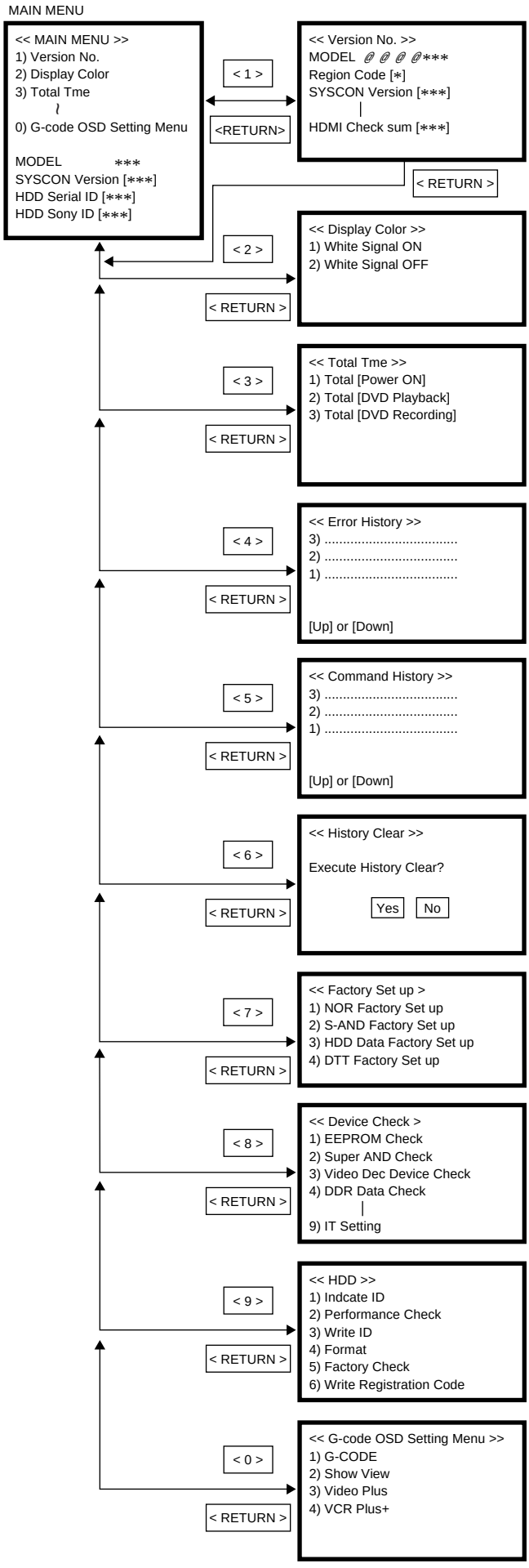
6-1. Check Item

Checking item	IC name	REF. NO
EEPROM	IC BR24L32FJ-WE2	IC102
VIDEO DEC	IC TVP5146M2PFP	IC301
DDR	IC K4H511638C-UCB3T	IC105
DDR	IC K4H511638C-UCB3T	IC106

All parts are mounted on the RD-064 board.

When NG is displayed as the result of the DEVICE TEST, the IC or its peripheral is defective.

6-2. Screen Transition in the Service Mode



Verifying version number of the respective software of the main unit

Setting ON/OFF of the PAL 100% white signal output

Reading the accumulative operating hours of the drive
- Total power-on hours
- Total DVD playback hours
- Total DVD recording hours

* Display format: ○○ hours △△ minutes

Displaying the error history in the past in the error code
* Maximum 20 errors can be displayed.

Displaying history of the buttons pressed in the past.
* Pressed buttons for 400 commands at a maximum can be stored.

Clearing the Error History and the Command History

Returning the Set Ups of various functions to default

Diagnostic checks in the Service Mode

6-3. Items and Description of Service Mode Menu

1) When the key “1” is pressed down, the monitor display moves to the Version No. check menu screen.
2) When the key “2” is pressed down, the monitor display moves to the Display Color check menu screen.
3) When the key “3” is pressed down, the monitor display moves to the Total Time check menu screen.
4) When the key “4”is pressed down, the monitor display moves to the Error History check menu screen.
5) When the key “5” is pressed down, the monitor display moves to the Command History check menu screen.
6) When the key “6” is pressed down, the monitor display moves to the History Clear check menu screen.
7) When the key “7” is pressed down, the monitor display moves to the Factory Set Up check menu screen.
8) When the key “8” is pressed down, the monitor display moves to the hard disk check menu screen.
9) When the key “9” is pressed down, the monitor display moves to the hard disk check menu screen.
0) When the key “0” is pressed down, the monitor display moves to the G-code Setting menu screen.

<< MAIN MENU >>
1) Version No.
2) Display Color
3) Total Time
4) Error History
5) Command History
6) History Clear
7) Factory Set Up
8) Device Check
9) HDD MODE
0) G-code Setting
MODEL ∗∗∗
SYSCON Version [∗∗∗]
HDD Serial ID [∗∗∗]
Sony ID [∗∗∗]

6-4. Device Check Menu (Diagnostic Test)

1) When the key “1” is pressed down, the EEPROM device check will be executed. (The EEPROM device is checked whether it is mounted or not, and the I2C communication between Rism3 (IC103) and EEPROM is checked.)
2) Key “2” is not used.
When the key “2” is pressed down, the super AND device check will be executed. (The super AND device is checked whether it is mounted or not, and the I2C communication between Rism3 (IC103) and super AND is checked.)
3) When the key “3” is pressed down, the Video Dec device check will be executed. (The Video Dec device is checked whether it is mounted or not, and the I2C communication between Rism3 (IC103) and Video Dec is checked.)
4) When the key “4” is pressed down, the DDR Data device check will be executed. (The DDR device is checked whether it is mounted or not, and the electrical signal connection between Rism3 (IC103) and DDR device is checked.)
5) Key “5” is not used.
When the key “5” is pressed down, the DSP device check will be executed. (The DSP device is checked whether it is mounted or not, and the electrical signal connection between Rism3 (IC103) and DSP device is checked.)
6) Key “6” is not used.
When the key “6” is pressed down, the USB device check will be executed. (The USB device is checked whether it is mounted or not, and the electrical signal connection between RISM3 (IC103) and USB device is checked.)
7) Key “7” is not used.
8) Key “8” is not used.
9) When the key “9” is pressed down, IC603 of the AV board will be patched.
(Never press the key “9” unless otherwise specified.)

<< Device check >>
1) EEPROM Check
2) Super AND Check → Not used
3) Video Dec Device Check
4) DDR Date Check
5) DSP Check → Not used
6) USB Check → Not used

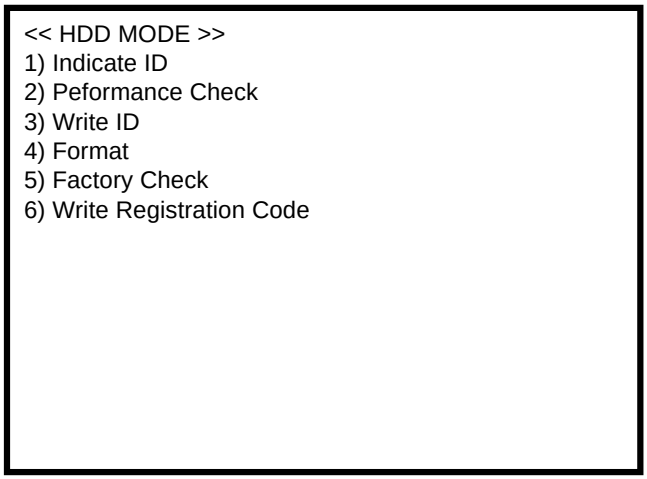
9) IT Setting

Check result display: IC105 check result/IC106 check result

Display Message	Meaning of Display
DATA OK/OK	Both IC105 and IC106 are OK.
DATA OK/NG	IC105: OK, IC106: NG (NG: No Good)
DATA NG/OK	IC105: NG, IC106: OK
DATA NG/NG	Both IC105 and IC106 are NG.

6-5. HDD service mode

1) When the key “1” is pressed down, the ID check will be executed as shown below.
   Indicate ID : HDD information read-out
   MODEL : Model name of the product
   Serial No. : HDD serial No.
   Model No. : HDD model No.
   F/W Rev : HDD software version
2) When the key “2” is pressed down, Performance Check will be executed as shown below.
   Performance Check: Power ON/OFF test and Read/Verify of all tracks
3) When the key “3” is pressed down, Write ID will be executed as shown below.
   Write ID: NOR Flash HDD information write
4) When the key “4” is pressed down, Format will be executed as shown below.
   Format : Full erase of HDD
5) When the key “5” is pressed down, Factory Check will be executed as shown below.
   Factory Check: Aging test in the same way as in the factory.
6) When the key “6” is pressed down, the Write Registration Code will be executed as shown below.
   Write Registration Code: Writing the DIVX Registration Code
7) When the “RETURN” key is pressed down, the monitor display will return to the menu screen.



SECTION 7
ADJUSTMENTS

7-1. Video System Adjustment

Preparing for Adjustment

1. Equipments

• Oscilloscope
• Reference Disk
HLX-507 (PAL single layer disc) J-6090-077-A
HLX-506 (PAL dual layer disc) J-6090-078-A

1. Video Output Level Check

<Purpose>

This check is made to satisfy the PAL signal standard, If it is adjusted incorrectly, brightness will be too bright or too dark.

Mode	PLAY
Signal	100% Color bars
Test point	Output (VIDEO) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	1.0 V± 0.07 Vp-p

Check method:

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the video level is 1.0 V±0.07 Vp-p.

Fig. 7-1

2. S-Video Output S-Y Check

<Purpose>

This check confirms that the S-video Y-signal output has the rated amplitude. If it adjusted incorrectly, the playback video signal will not be displayed corrected even when the S-video cable is connected.

Mode	PLAY
Signal	100% Color bars
Test point	S-VIDEO OUTPUT (S-Y) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	1.0 V±0.07 Vp-p

Check method:

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the video level is 1.0 V±0.07 Vp-p.

Fig. 7-2

3. S-Video Output S-C Check

<Purpose>

This check confirms that the S-video output S-C conforms to the PAL standard. If it adjusted incorrectly, the playback color will not be too dark or too thin.

Mode	PLAY
Signal	100% Color bars
Test point	S-VIDEO OUTPUT (S-C) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	300 mV±30 mVp-p

Check method:

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the burst signal level is 300 mV±30 mVp-p.

Fig. 7-3

4. Component Video Output Y Check

<Purpose>

This check confirms that the component Y signal output has the rated amplitude. If this signal level is not correct, brightness of the video signal will not be too dark or too thin when the COMPONENT connector output signal is connected to a projector having COMPONENT input.

Mode	PLAY
Signal	100% Color bars
Test point	COMPONENT VIDEO OUT (Y) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	1.0 V±0.07Vp-p

Check method:

Note: COMPONENT OUT should be set to ON.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the Y signal level is 1.0 V±0.07 Vp-p.

Fig. 7-4

5. Component Video Output B-Y (Pb) Check

<Purpose>

This check confirms that the B-Y signal of the component video conforms to the PAL standard. If this signal level is not correct, color of the video signal will have different color when the COMPONENT connector output signal is connected to a projector having COMPONENT input.

Mode	PLAY
Signal	100% Color bars
Test point	COMPONENT VIDEO OUT (Pb) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	700 mV±50 mVp-p

Check method:

Note: COMPONENT OUT should be set to ON.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the burst signal level is 700 mV±50 mVp-p.

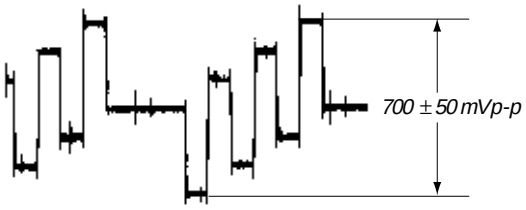


Fig. 7-5

6. Component Video Output R-Y (Pr) Check

<Purpose>

This check confirms that the R-Y signal of the component video conforms to the PAL standard. If this signal level is not correct, color of the video signal will have different color when the COMPONENT connector output signal is connected to a projector having COMPONENT input.

Mode	PLAY
Signal	100% Color bars
Test point	COMPONENT VIDEO OUT (Pr) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	700 mV±50 mVp-p

Check method:

Note: COMPONENT OUT should be set to ON.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the burst signal level is 700 mV±50 mVp-p.

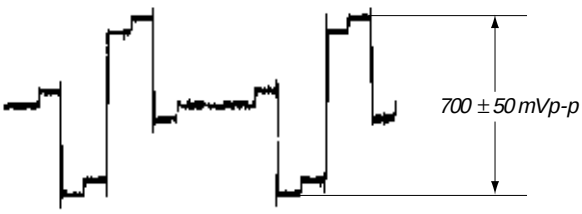


Fig. 7-6

7. Scart Video Output Level Check

<Purpose>

This check is made to satisfy the PAL signal standard, If it is adjusted incorrectly, brightness will be too bright or too dark.

Mode	PLAY
Signal	100% Color bars
Test point	Scart Video output connector pin-⑲ (terminated in 75Ω)
Instrument	Oscilloscope
Specification	1.0 V± 0.07 Vp-p

Check method:

Note: COMPONENT OUT should be set to OFF.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the video level is 1.0 V±0.07 Vp-p.

Fig. 7-7

8. Scart Video Output S-Y Check

<Purpose>

This check confirms that the Scart Y-signal output has the rated amplitude. If it adjusted incorrectly, the playback video signal will not be displayed corrected even when the Scart cable is connected.

Mode	PLAY
Signal	100% Color bars
Test point	Scart Video output connector pin-⑲ (terminated in 75Ω)
Instrument	Oscilloscope
Specification	1.0 V±0.07 Vp-p

Check method:

Note: COMPONENT OUT should be set to OFF.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the video level is 1.0 V±0.07 Vp-p.

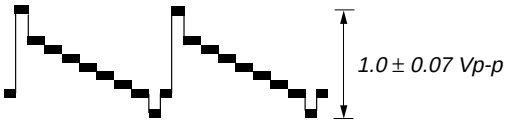


Fig. 7-8

9. Scart Video Output S-C Check

<Purpose>

This check confirms that the Scart output S-C conforms to the PAL standard. If it adjusted incorrectly, the playback color will not be too dark or too thin.

Mode	PLAY
Signal	100% Color bars
Test point	Scart Video output connector pin-⑮ (terminated in 75Ω)
Instrument	Oscilloscope
Specification	300 mV±30 mVp-p

Check method:

Note: COMPONENT OUT should be set to OFF.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the burst signal level is 300 mV±30 mVp-p.

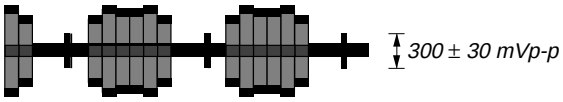


Fig. 7-9

10. Scart Video RGB Output R Check

<Purpose>

This check confirms that the RGB R signal output has the rated amplitude. If this signal level is not correct, brightness of the video signal will not be too dark or too thin when the Scart connector output signal is connected to a projector having Scart input.

Mode	PLAY
Signal	100% Color bars
Test point	Scart Video output R connector pin-⑮ (terminated in 75Ω)
Instrument	Oscilloscope
Specification	700 mV±50 mVp-p

Check method:

Note: COMPONENT OUT should be set to OFF.
RGB OUT should be set to ON.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the R signal level is 700 mV±50 mVp-p.

Fig. 7-10

11. Scart Video RGB Output G Check

<Purpose>

This check confirms that G signal of the RGB video conforms to the PAL standard. If this signal level is not correct, color of the video signal will have different color when the Scart connector output signal is connected to a projector having Scart input.

Mode	PLAY
Signal	100% Color bars
Test point	Scart Video output G connector pin-⑪ (terminated in 75Ω)
Instrument	Oscilloscope
Specification	700 mV±50 mVp-p

Check method:

Note: COMPONENT OUT should be set to OFF.
RGB OUT should be set to ON.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the G signal level is 700 mV±50 mVp-p.

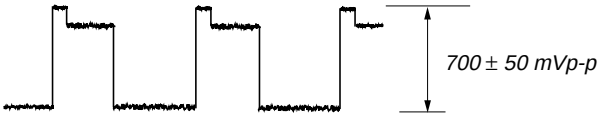


Fig. 7-11

12. Scart Video RGB Output B Check

<Purpose>

This check confirms that the B signal of the RGB video conforms to the PAL standard. If this signal level is not correct, color of the video signal will have different color when the Scart connector output signal is connected to a projector having Scart input.

Mode	PLAY
Signal	100% Color bars
Test point	Scart Video output B connector pin-⑦ (terminated in 75Ω)
Instrument	Oscilloscope
Specification	700 mV±50 mVp-p

Check method:

Note: COMPONENT OUT should be set to OFF.
RGB OUT should be set to ON.

1) Insert the PAL reference disc and play back the 100% color bars.
2) Confirm that the B signal level is 700 mV±50 mVp-p.

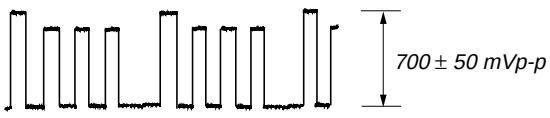


Fig. 7-12

SECTION 8
REPAIR PARTS LIST

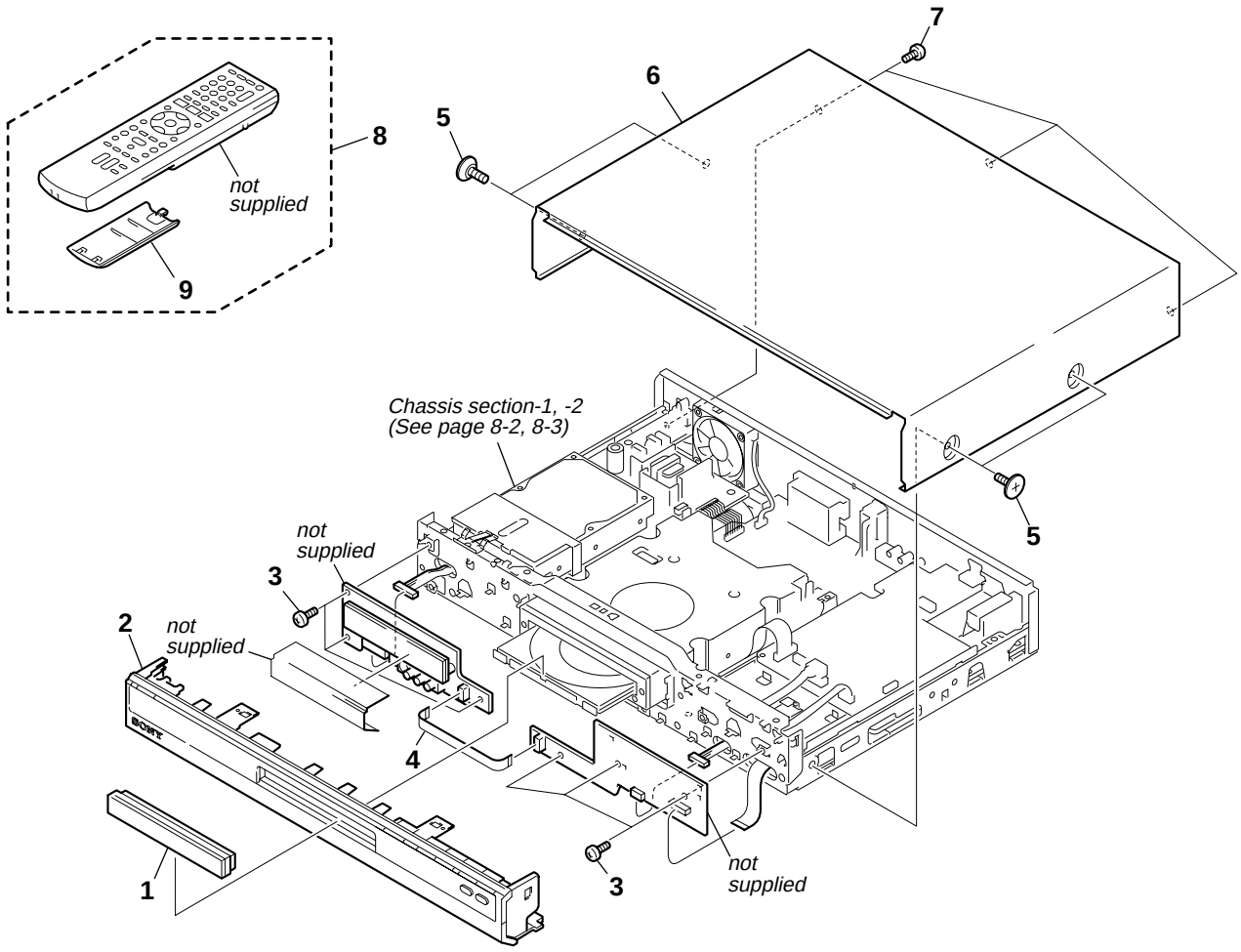
8-1. EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color

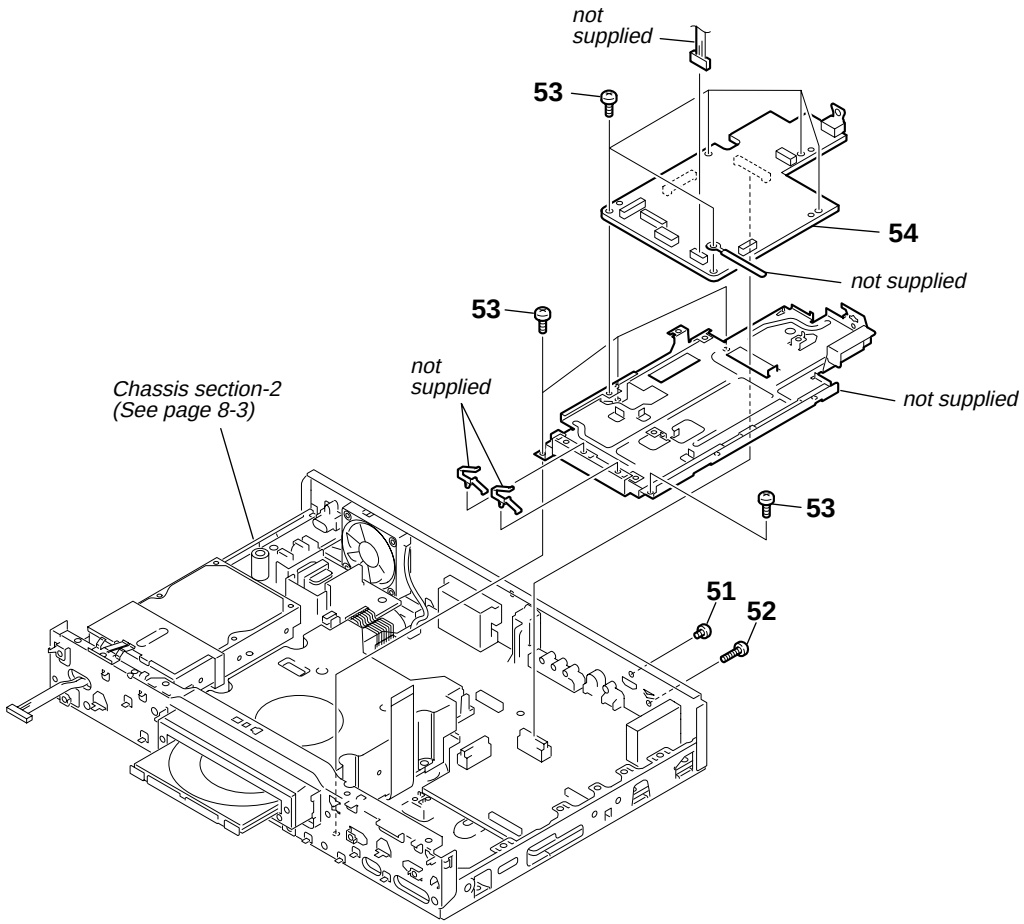
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

8-1-1. OVERALL SECTION



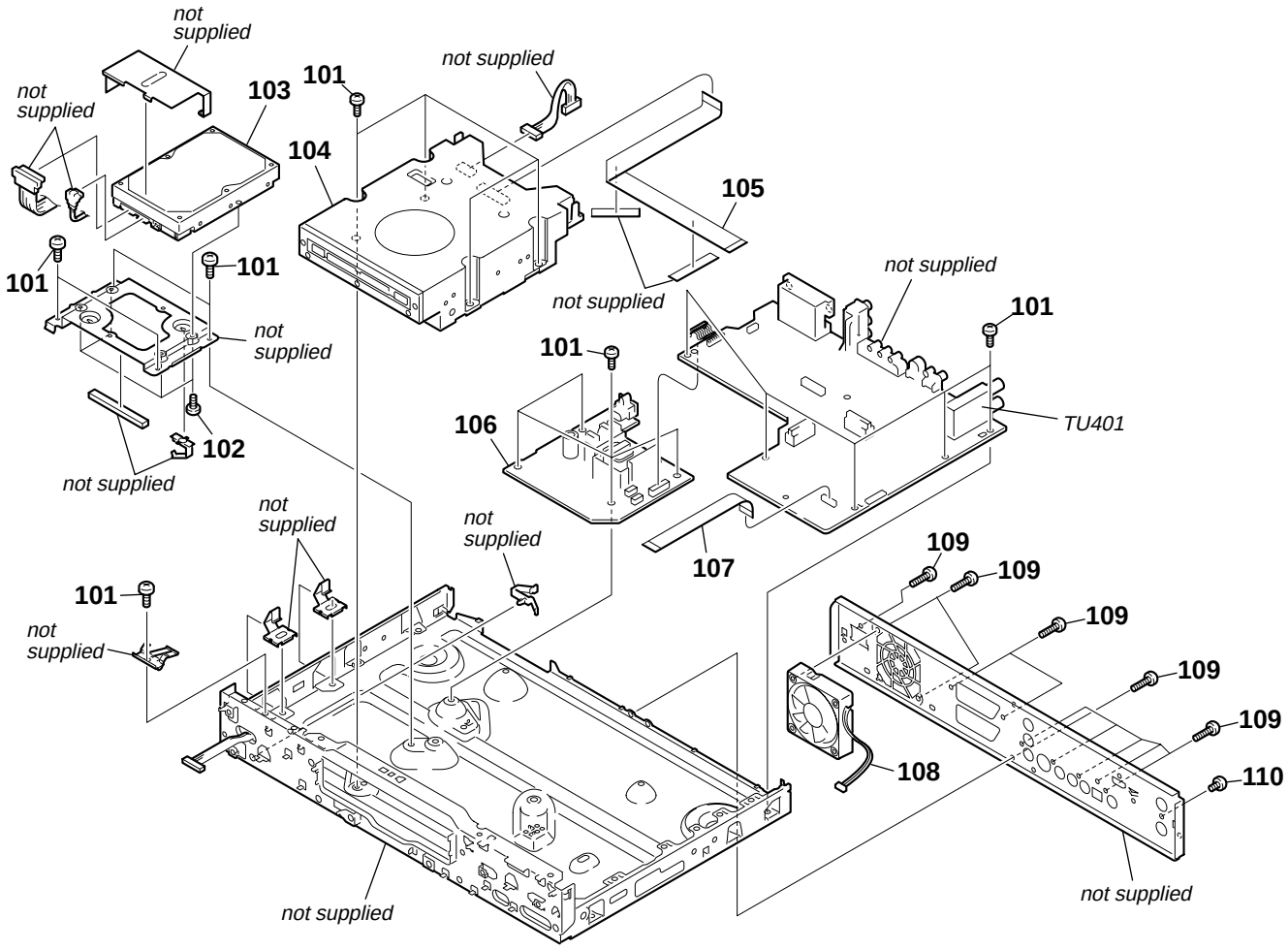
Ref. No.	Part No.	Description	Remarks
1	X-2149-427-1	ASSY, TRAY	
2	X-2149-426-1	FRONT PANEL ASSY (HX825)	
2	X-2149-435-1	FRONT PANEL ASSY (HX820)	
3	3-077-331-01	+BV3 (3-CR)	
4	1-833-387-11	CABLE, FLEXIBLE FLAT (FLR-008)	
5	3-070-883-61	SCREW, TAPPING	
6	A-1209-198-A	CASE BLOCK ASSY (SERVICE USE)	
7	3-076-563-11	SCREW, SPECIAL FRONT POINT	
8	1-479-557-11	REMOTE COMMANDER (RMT-D231P) (HX825)	
8	1-479-558-11	REMOTE COMMANDER (RMT-D230P) (HX820)	
9	2-658-476-01	COVER, BATTERY (FOR RMT-D230P/D231P)	

8-1-2. CHASSIS SECTION-1



Ref. No.	Part No.	Description	Remarks
51	3-088-023-01	+B3 (3-CR)	
52	3-077-331-31	+BV3 (3-CR)	
53	3-077-331-01	+BV3 (3-CR)	
* 54	A-1494-643-A	RD-064 BOARD, COMPLETE (SERVICE) (HX820)	
* 54	A-1215-024-A	RD-064 BOARD, COMPLETE (SERVICE) (HX825)	

8-1-3. CHASSIS SECTION-2



Ref. No.	Part No.	Description	Remarks
101	3-077-331-01	+BV3 (3-CR)	
102	3-087-675-01	6-32UNCX5	
⚠103	A-1219-462-A	HDD(SATA/WD-160GB-E) ASSY (SERVICE)	
⚠104	1-797-413-11	DRIVE, DVD DRW-V35A	
105	1-833-383-11	CABLE, FLEXIBLE FLAT (FRD-011)	
⚠106	1-474-022-11	POWER BLOCK	
107	1-833-388-11	CABLE, FLEXIBLE FLAT (FAR-005)	
108	1-787-291-11	FAN, D.C	
109	3-077-331-31	+BV3 (3-CR)	
110	3-088-023-01	+B3 (3-CR)	
⚠TU401	8-597-559-00	TUNER, FSS BTF-DF441	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: μF
- COILS
  uH: μH
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
		AV-106 BOARD, COMPLETE			
		**********			
		(Ref.No.;10,000 SERIES)			
		< CAPACITOR >			
C105	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C106	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C107	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C108	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C114	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C117	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C118	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C119	1-100-591-91	CERAMIC CHIP	1uF	10%	25V
C120	1-100-591-91	CERAMIC CHIP	1uF	10%	25V
C123	1-126-947-11	ELECT	47uF	20%	35V
C124	1-128-396-11	ELECT CHIP	470uF	20%	10V
C125	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C127	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C128	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C129	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C130	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C131	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C134	1-124-584-00	ELECT	100uF	20%	10V
C135	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C151	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C155	1-124-589-11	ELECT	47uF	20%	16V
C159	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C160	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C209	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C210	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C211	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C212	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C213	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C214	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C215	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C216	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C217	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C218	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C301	1-124-589-11	ELECT	47uF	20%	16V
C304	1-125-972-91	ELECT	100uF	20%	16V
C306	1-124-234-00	ELECT	22uF	20%	16V
C307	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C308	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C309	1-124-589-11	ELECT	47uF	20%	16V
C310	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C311	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C312	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C313	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C314	1-164-218-11	CERAMIC CHIP	180PF	5%	50V
C315	1-164-218-11	CERAMIC CHIP	180PF	5%	50V
C316	1-124-589-11	ELECT	47uF	20%	16V
C317	1-124-589-11	ELECT	47uF	20%	16V
C318	1-128-398-11	ELECT CHIP	220uF	20%	16V
C319	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C320	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C321	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C322	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C324	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C325	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C326	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C327	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C336	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C337	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C401	1-124-589-11	ELECT	47uF	20%	16V
C405	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C407	1-124-261-00	ELECT	10uF	20%	50V
C408	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C409	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C410	1-124-261-00	ELECT	10uF	20%	50V
C411	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C414	1-124-589-11	ELECT	47uF	20%	16V
C415	1-124-584-00	ELECT	100uF	20%	10V
C416	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C449	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C452	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C453	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C454	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C455	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C456	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C601	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C602	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C604	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C607	1-124-589-11	ELECT	47uF	20%	16V
C613	1-162-910-11	CERAMIC CHIP	5PF	0.25PF	50V
C614	1-162-908-11	CERAMIC CHIP	3PF	0.25PF	50V
C615	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C616	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C617	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C618	1-124-589-11	ELECT	47uF	20%	16V
C619	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C620	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C621	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C622	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C623	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C624	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C625	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C626	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C627	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C628	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C629	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C630	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C631	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C632	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C633	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C634	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C635	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C639	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C641	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C642	1-124-589-11	ELECT	47uF	20%	16V
C646	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C649	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C650	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C651	1-126-925-91	ELECT	470uF	20%	10V
C652	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C653	1-162-908-11	CERAMIC CHIP	3PF	0.25PF	50V
C654	1-162-909-11	CERAMIC CHIP	4PF	0.25PF	50V
C655	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C656	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C657	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C701	1-126-947-11	ELECT	47uF	20%	35V
C702	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C703	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C704	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C705	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C706	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C707	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C708	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C709	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C710	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C711	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C712	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C713	1-124-290-00	ELECT	47uF	20%	10V
C714	1-126-947-11	ELECT	47uF	20%	35V
C715	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C716	1-126-947-11	ELECT	47uF	20%	35V
C717	1-126-947-11	ELECT	47uF	20%	35V
C718	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C719	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C720	1-126-947-11	ELECT	47uF	20%	35V
C721	1-126-947-11	ELECT	47uF	20%	35V
C722	1-126-964-11	ELECT	10uF	20%	50V
C723	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C724	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C725	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C726	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C727	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C728	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C729	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C730	1-104-662-91	ELECT	22uF	20%	25V
C731	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C732	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C733	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C734	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C735	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C736	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C737	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C738	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C739	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C740	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C741	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C742	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C743	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C744	1-126-947-11	ELECT	47uF	20%	35V
C745	1-126-947-11	ELECT	47uF	20%	35V
C746	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C747	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C748	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C749	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C750	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C751	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C752	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C753	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C762	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C772	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C774	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C775	1-126-947-11	ELECT	47uF	20%	35V
C801	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C802	1-126-964-11	ELECT	10uF	20%	50V
C803	1-126-964-11	ELECT	10uF	20%	50V
C804	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C805	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C807	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C809	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C810	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C813	1-104-658-91	ELECT	100uF	20%	10V
C816	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C817	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C818	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C819	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C820	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C821	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C822	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C823	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C824	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C825	1-104-658-91	ELECT	100uF	20%	10V
C826	1-126-947-11	ELECT	47uF	20%	35V
C827	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C828	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C829	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C830	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C832	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C833	1-126-947-11	ELECT	47uF	20%	35V
C834	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C835	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C836	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C837	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C838	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C839	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C840	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C841	1-126-947-11	ELECT	47uF	20%	35V

Ref. No.	Part No.	Description			Remarks
C842	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C843	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C844	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C845	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C846	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C847	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C848	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C849	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C850	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C851	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C852	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C853	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C854	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C855	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C856	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C861	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C862	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C863	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C864	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C865	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C866	1-126-947-11	ELECT	47uF	20%	35V
C867	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1103	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V (HX825)
C1104	1-162-962-11	CERAMIC CHIP	470PF	10%	50V (HX825)
C1109	1-162-917-11	CERAMIC CHIP	15PF	5%	50V (HX825)
C1110	1-162-917-11	CERAMIC CHIP	15PF	5%	50V (HX825)
C1111	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V (HX825)
C1401	1-124-589-11	ELECT	47uF	20%	16V
C1402	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1403	1-162-924-11	CERAMIC CHIP	56PF	5%	50V
C1404	1-162-907-11	CERAMIC CHIP	2PF	0.25PF	50V
C1405	1-162-907-11	CERAMIC CHIP	2PF	0.25PF	50V
C1406	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1407	1-162-924-11	CERAMIC CHIP	56PF	5%	50V
C1408	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1409	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1410	1-124-261-00	ELECT	10uF	20%	50V
C1411	1-126-162-11	ELECT	3.3uF	20%	50V
C1412	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1413	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1414	1-124-261-00	ELECT	10uF	20%	50V
C1415	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C1416	1-124-589-11	ELECT	47uF	20%	16V
C1417	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1418	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1419	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1452	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1453	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
		< CONNECTOR >			
CN101	1-815-458-21	CONNECTOR, BOARD TO BOARD 15P			
CN103	1-794-509-11	PIN, CONNECTOR (PC BOARD) (3P)			
CN501	1-818-859-11	CONNECTOR, BOARD TO BOARD 42P			
CN502	1-818-859-11	CONNECTOR, BOARD TO BOARD 42P			
* CN601	1-764-643-21	PIN, CONNECTOR (SMD) 11P			

Ref. No.	Part No.	Description	Remarks
* CN701	1-770-468-21	PIN, CONNECTOR (PC BOARD) 10P	
		< DIODE >	
D101	8-719-073-34	DIODE EC21QS03L-TE12L	
D301	6-501-115-01	DIODE BAS16-03W	
D303	6-501-115-01	DIODE BAS16-03W	
D304	6-501-115-01	DIODE BAS16-03W	
D608	6-501-115-01	DIODE BAS16-03W	
D701	6-501-115-01	DIODE BAS16-03W	
D702	8-719-067-40	DIODE STZ6.8N-T146	
D703	8-719-053-18	DIODE 1SR154-400TE-25	
D704	8-719-053-18	DIODE 1SR154-400TE-25	
D714	8-719-067-40	DIODE STZ6.8N-T146	
D715	8-719-067-40	DIODE STZ6.8N-T146	
D721	8-719-067-40	DIODE STZ6.8N-T146	
D724	8-719-067-40	DIODE STZ6.8N-T146	
D728	8-719-067-40	DIODE STZ6.8N-T146	
D731	8-719-067-40	DIODE STZ6.8N-T146	
D732	8-719-067-40	DIODE STZ6.8N-T146	
D801	8-719-069-55	DIODE UDZSTE-175.6B	
D802	8-719-067-40	DIODE STZ6.8N-T146	
D803	8-719-067-40	DIODE STZ6.8N-T146	
D804	6-501-486-01	DIODE NNCD3.9F-T1B	
D805	6-501-486-01	DIODE NNCD3.9F-T1B	
D806	8-719-067-40	DIODE STZ6.8N-T146	
D807	8-719-067-40	DIODE STZ6.8N-T146	
D808	8-719-067-40	DIODE STZ6.8N-T146	
D809	8-719-067-40	DIODE STZ6.8N-T146	
D810	8-719-067-40	DIODE STZ6.8N-T146	
D811	8-719-067-40	DIODE STZ6.8N-T146	
D812	8-719-067-40	DIODE STZ6.8N-T146	
D813	8-719-067-40	DIODE STZ6.8N-T146	
D814	8-719-069-56	DIODE UDZSTE-176.2B	
D815	8-719-083-63	DIODE UDZSTE-1713B	
D816	8-719-069-56	DIODE UDZSTE-176.2B	
D817	8-719-083-63	DIODE UDZSTE-1713B	
D818	6-501-486-01	DIODE NNCD3.9F-T1B	
D819	8-719-067-40	DIODE STZ6.8N-T146	
D820	8-719-067-40	DIODE STZ6.8N-T146	
D821	6-501-486-01	DIODE NNCD3.9F-T1B	
D822	8-719-067-40	DIODE STZ6.8N-T146	
D823	8-719-067-40	DIODE STZ6.8N-T146	
D824	8-719-067-40	DIODE STZ6.8N-T146	
D825	8-719-069-56	DIODE UDZSTE-176.2B	
D827	8-719-067-40	DIODE STZ6.8N-T146	
D828	8-719-069-56	DIODE UDZSTE-176.2B	
D1103	8-719-067-40	DIODE STZ6.8N-T146 (HX825)	
D1400	6-501-115-01	DIODE BAS16-03W	
D1401	6-501-115-01	DIODE BAS16-03W	
		< FUSE >	
⚠F101	1-576-570-21	FUSE, MICRO (1608 TYPE) 0.63A	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
		< FERRITE BEAD >	
FB701	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB702	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB801	1-500-283-11	INDUCTOR, FERRITE BEAD	
FB802	1-469-876-11	INDUCTOR, FERRITE BEAD	
FB803	1-469-796-21	FERRITE, CHIP	
FB804	1-469-796-21	FERRITE, CHIP	
FB805	1-469-796-21	FERRITE, CHIP	
FB806	1-469-796-21	FERRITE, CHIP	
FB807	1-469-796-21	FERRITE, CHIP	
FB808	1-500-283-11	INDUCTOR, FERRITE BEAD	
FB809	1-469-876-11	INDUCTOR, FERRITE BEAD	
FB810	1-469-796-21	FERRITE, CHIP	
FB811	1-469-796-21	FERRITE, CHIP	
FB812	1-469-796-21	FERRITE, CHIP	
FB813	1-469-796-21	FERRITE, CHIP	
FB814	1-469-796-21	FERRITE, CHIP	
FB815	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB816	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB817	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB818	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB819	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB820	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB821	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB822	1-414-228-11	INDUCTOR, FERRITE BEAD	
FB824	1-469-796-21	FERRITE, CHIP	
FB1608	1-469-775-21	INDUCTOR, FERRITE BEAD	
FB1609	1-469-775-21	INDUCTOR, FERRITE BEAD	
		< IC >	
IC102	6-702-889-01	IC SI-3033KS-TL	
IC104	6-708-913-01	IC TK73400AU3G0L-C	
IC107	6-707-208-01	IC TK11100CSCB-G	
IC109	6-708-889-01	IC MP2105DJ-LF-Z	
IC202	8-759-100-96	IC uPC4558G2	
IC203	8-759-100-96	IC uPC4558G2	
IC302	8-759-100-96	IC uPC4558G2	
IC303	6-705-313-01	IC S-T111B50MC-OHJTFG	
IC304	1-818-512-11	CONNECTOR FOR OPTICAL FIBRE	
IC401	8-749-925-00	IC TK11819MTL	
IC402	6-706-237-01	IC PQ1MX55M2SPQ	
IC601	6-710-144-01	IC S-80952CNMC-G9NT2G	
IC603	6-806-806-01	IC M306H5MG-A14FP (HX825)	
IC603	6-806-866-01	IC M306H5MC-C36FP (HX820)	
* IC604	6-708-842-01	IC S-24CS04AFJ-TB-G	
* IC605	6-708-948-01	IC R2051S03-E2-F	
IC701	6-708-957-01	IC TK72233CMCL-G	
* IC702	6-708-890-01	IC LA73036M-TBA-E	
IC801	6-705-338-01	IC TK11250CMCL-G	
IC802	6-708-892-01	IC BD3826FS	
IC803	6-708-887-01	IC BH7626KS2	
IC1102	6-806-080-01	IC M30263M6A-703FP (HX825)	
IC1103	8-759-649-43	IC SN74AHC1G00DCKR (HX825)	
IC1401	6-702-714-01	IC MSP3417G-QG-B8V3	
		< JACK >	
J703	1-818-063-11	JACK, PIN (3P) (COMPONENT OUT)	
J1101	1-764-188-31	JACK (SMALL TYPE) (DIA. 3.5) (HX825)	

Ref. No.	Part No.	Description	Remarks
		< COIL >	
L102	1-419-630-21	INDUCTOR 4.7uH	
L401	1-414-856-11	INDUCTOR 10uH	
L402	1-469-967-21	INDUCTOR 10uH	
L403	1-414-858-31	INDUCTOR 1mH	
L404	1-414-856-11	INDUCTOR 10uH	
L405	1-414-856-11	INDUCTOR 10uH	
L406	1-414-856-11	INDUCTOR 10uH	
L701	1-412-060-11	INDUCTOR 22uH	
L702	1-469-967-21	INDUCTOR 10uH	
L703	1-469-967-21	INDUCTOR 10uH	
L704	1-469-967-21	INDUCTOR 10uH	
L803	1-414-743-21	INDUCTOR 47uH	
L1401	1-414-856-11	INDUCTOR 10uH	
		< IC LINK >	
⚠ PS102	1-576-570-21	FUSE, MICRO (1608 TYPE) 0.63A	
⚠ PS103	1-576-570-21	FUSE, MICRO (1608 TYPE) 0.63A	
⚠ PS602	1-576-570-21	FUSE, MICRO (1608 TYPE) 0.63A	
		< TRANSISTOR >	
Q101	8-729-421-19	TRANSISTOR UN2213	
Q301	8-729-424-08	TRANSISTOR UN2111	
Q302	8-729-921-80	TRANSISTOR 2SD1781K-T146-QR	
Q303	8-729-010-29	TRANSISTOR MSD601-RST1	
Q304	8-729-045-17	TRANSISTOR 2SB1561T100Q	
Q305	8-729-421-19	TRANSISTOR UN2213	
Q306	8-729-421-19	TRANSISTOR UN2213	
Q307	8-729-027-53	TRANSISTOR DTC124TKA-T146	
Q308	8-729-027-53	TRANSISTOR DTC124TKA-T146	
Q309	6-551-287-01	TRANSISTOR 2SD2704K-T146	
Q310	6-551-287-01	TRANSISTOR 2SD2704K-T146	
Q311	8-729-010-05	TRANSISTOR MSB709-RT1	
Q312	8-729-010-05	TRANSISTOR MSB709-RT1	
Q313	8-729-010-29	TRANSISTOR MSD601-RST1	
Q401	8-729-010-29	TRANSISTOR MSD601-RST1	
Q403	8-729-010-29	TRANSISTOR MSD601-RST1	
Q405	8-729-010-29	TRANSISTOR MSD601-RST1	
Q407	8-729-421-19	TRANSISTOR UN2213	
Q601	8-729-421-19	TRANSISTOR UN2213	
Q611	8-729-421-22	TRANSISTOR UN2211	
Q612	8-729-010-05	TRANSISTOR MSB709-RT1	
Q613	8-729-010-29	TRANSISTOR MSD601-RST1	
Q614	8-729-010-29	TRANSISTOR MSD601-RST1	
Q615	8-729-010-29	TRANSISTOR MSD601-RST1	
Q616	8-729-904-87	TRANSISTOR 2SB1197K-R	
Q702	8-729-010-29	TRANSISTOR MSD601-RST1	
Q705	8-729-010-05	TRANSISTOR MSB709-RT1	
Q707	8-729-010-29	TRANSISTOR MSD601-RST1	
Q708	8-729-010-29	TRANSISTOR MSD601-RST1	
Q709	8-729-010-29	TRANSISTOR MSD601-RST1	
Q710	8-729-010-29	TRANSISTOR MSD601-RST1	
Q711	8-729-010-29	TRANSISTOR MSD601-RST1	
Q715	8-729-904-87	TRANSISTOR 2SB1197K-R	
Q716	8-729-421-19	TRANSISTOR UN2213	
Q801	8-729-010-05	TRANSISTOR MSB709-RT1	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
Q807	6-550-683-01	TRANSISTOR	RJK005N03-T146		
Q808	8-729-027-24	TRANSISTOR	DTA114TKA-T146		
Q1104	8-729-045-17	TRANSISTOR	2SB1561T100Q (HX825)		
Q1401	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q1402	8-729-010-29	TRANSISTOR	MSD601-RST1		
		< RESISTOR >			
R102	1-216-296-11	SHORT CHIP	0		
R104	1-218-911-11	METAL CHIP	470K	0.5%	1/10W
R107	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R108	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R111	1-216-833-11	METAL CHIP	10K	5%	1/10W
R113	1-218-896-11	METAL CHIP	110K	0.5%	1/10W
R114	1-218-875-11	METAL CHIP	15K	0.5%	1/10W
R115	1-218-869-11	METAL CHIP	8.2K	0.5%	1/10W
R118	1-216-797-11	METAL CHIP	10	5%	1/10W
R120	1-216-864-11	SHORT CHIP	0		
R121	1-218-885-11	METAL CHIP	39K	0.5%	1/10W
R122	1-218-873-11	METAL CHIP	12K	0.5%	1/10W
R135	1-216-295-91	SHORT CHIP	0		
R137	1-216-295-91	SHORT CHIP	0		
R140	1-216-295-91	SHORT CHIP	0		
R142	1-216-295-91	SHORT CHIP	0		
R144	1-216-295-91	SHORT CHIP	0		
R146	1-216-295-91	SHORT CHIP	0		
R148	1-216-295-91	SHORT CHIP	0		
R154	1-216-295-91	SHORT CHIP	0		
R160	1-216-864-11	SHORT CHIP	0		
R161	1-216-296-11	SHORT CHIP	0		
R162	1-216-296-11	SHORT CHIP	0		
R168	1-216-295-91	SHORT CHIP	0		
R169	1-216-295-91	SHORT CHIP	0		
R170	1-216-295-91	SHORT CHIP	0		
R173	1-216-296-11	SHORT CHIP	0		
R174	1-216-296-11	SHORT CHIP	0		
R175	1-216-296-11	SHORT CHIP	0		
R176	1-216-296-11	SHORT CHIP	0		
R218	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R219	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R222	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R223	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R224	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R225	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R226	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R227	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R304	1-216-849-11	METAL CHIP	220K	5%	1/10W
R305	1-216-833-11	METAL CHIP	10K	5%	1/10W
R306	1-216-833-11	METAL CHIP	10K	5%	1/10W
R307	1-216-833-11	METAL CHIP	10K	5%	1/10W
R308	1-216-841-11	METAL CHIP	47K	5%	1/10W
R309	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R310	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R311	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R312	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R313	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R314	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R315	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W

Ref. No.	Part No.	Description			Remarks
R316	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R317	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R318	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R320	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R321	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R323	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R326	1-216-817-11	METAL CHIP	470	5%	1/10W
R327	1-216-817-11	METAL CHIP	470	5%	1/10W
R330	1-216-841-11	METAL CHIP	47K	5%	1/10W
R331	1-216-841-11	METAL CHIP	47K	5%	1/10W
R332	1-216-833-11	METAL CHIP	10K	5%	1/10W
R333	1-216-833-11	METAL CHIP	10K	5%	1/10W
R334	1-216-833-11	METAL CHIP	10K	5%	1/10W
R335	1-216-841-11	METAL CHIP	47K	5%	1/10W
R336	1-216-833-11	METAL CHIP	10K	5%	1/10W
R337	1-216-841-11	METAL CHIP	47K	5%	1/10W
R338	1-216-833-11	METAL CHIP	10K	5%	1/10W
R339	1-216-833-11	METAL CHIP	10K	5%	1/10W
R340	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R342	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R343	1-216-845-11	METAL CHIP	100K	5%	1/10W
R344	1-216-845-11	METAL CHIP	100K	5%	1/10W
R345	1-216-821-11	METAL CHIP	1K	5%	1/10W
R346	1-216-821-11	METAL CHIP	1K	5%	1/10W
R347	1-216-821-11	METAL CHIP	1K	5%	1/10W
R348	1-216-813-11	METAL CHIP	220	5%	1/10W
R350	1-216-807-11	METAL CHIP	68	5%	1/10W
R353	1-216-817-11	METAL CHIP	470	5%	1/10W
R355	1-216-817-11	METAL CHIP	470	5%	1/10W
R364	1-216-839-11	METAL CHIP	33K	5%	1/10W
R365	1-216-845-11	METAL CHIP	100K	5%	1/10W
R366	1-216-821-11	METAL CHIP	1K	5%	1/10W
R405	1-216-817-11	METAL CHIP	470	5%	1/10W
R407	1-216-821-11	METAL CHIP	1K	5%	1/10W
R409	1-216-821-11	METAL CHIP	1K	5%	1/10W
R410	1-216-809-11	METAL CHIP	100	5%	1/10W
R411	1-216-809-11	METAL CHIP	100	5%	1/10W
R412	1-216-809-11	METAL CHIP	100	5%	1/10W
R414	1-216-845-11	METAL CHIP	100K	5%	1/10W
R415	1-216-838-11	METAL CHIP	27K	5%	1/10W
R418	1-216-845-11	METAL CHIP	100K	5%	1/10W
R420	1-216-809-11	METAL CHIP	100	5%	1/10W
R422	1-216-809-11	METAL CHIP	100	5%	1/10W
R423	1-216-864-11	SHORT CHIP	0		
R428	1-216-817-11	METAL CHIP	470	5%	1/10W
R429	1-216-817-11	METAL CHIP	470	5%	1/10W
R475	1-216-864-11	SHORT CHIP	0		
R501	1-216-864-11	SHORT CHIP	0		
R604	1-216-841-11	METAL CHIP	47K	5%	1/10W
R606	1-216-833-11	METAL CHIP	10K	5%	1/10W
R608	1-216-833-11	METAL CHIP	10K	5%	1/10W
R609	1-216-845-11	METAL CHIP	100K	5%	1/10W
R610	1-216-809-11	METAL CHIP	100	5%	1/10W
R611	1-216-833-11	METAL CHIP	10K	5%	1/10W
R613	1-216-833-11	METAL CHIP	10K	5%	1/10W
R614	1-216-833-11	METAL CHIP	10K	5%	1/10W
R615	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R616	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R617	1-216-833-11	METAL CHIP	10K	5%	1/10W
R618	1-218-875-11	METAL CHIP	15K	0.5%	1/10W

Ref. No.	Part No.	Description			Remarks
R619	1-216-833-11	METAL CHIP	10K	5%	1/10W
R620	1-216-833-11	METAL CHIP	10K	5%	1/10W
R621	1-216-833-11	METAL CHIP	10K	5%	1/10W
R622	1-216-833-11	METAL CHIP	10K	5%	1/10W
R623	1-216-864-11	SHORT CHIP	0		
R624	1-216-809-11	METAL CHIP	100	5%	1/10W
R626	1-216-864-11	SHORT CHIP	0		
R627	1-216-833-11	METAL CHIP	10K	5%	1/10W
R628	1-216-817-11	METAL CHIP	470	5%	1/10W
R629	1-216-864-11	SHORT CHIP	0		
R630	1-216-809-11	METAL CHIP	100	5%	1/10W
R631	1-216-809-11	METAL CHIP	100	5%	1/10W
R632	1-216-809-11	METAL CHIP	100	5%	1/10W
R633	1-216-809-11	METAL CHIP	100	5%	1/10W
R635	1-216-809-11	METAL CHIP	100	5%	1/10W
R636	1-216-809-11	METAL CHIP	100	5%	1/10W
R637	1-218-289-11	METAL CHIP	510	5%	1/10W
R638	1-216-864-11	SHORT CHIP	0		
R639	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R642	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R643	1-216-833-11	METAL CHIP	10K	5%	1/10W
R644	1-216-809-11	METAL CHIP	100	5%	1/10W
R645	1-216-833-11	METAL CHIP	10K	5%	1/10W
R646	1-216-833-11	METAL CHIP	10K	5%	1/10W
R647	1-216-817-11	METAL CHIP	470	5%	1/10W
R648	1-216-864-11	SHORT CHIP	0 (HX825)		
R649	1-216-809-11	METAL CHIP	100	5%	1/10W
R650	1-216-833-11	METAL CHIP	10K	5%	1/10W (HX825)
R651	1-216-809-11	METAL CHIP	100	5%	1/10W
R652	1-216-809-11	METAL CHIP	100	5%	1/10W (HX825)
R654	1-216-809-11	METAL CHIP	100	5%	1/10W (HX825)
R655	1-216-809-11	METAL CHIP	100	5%	1/10W
R656	1-216-821-11	METAL CHIP	1K	5%	1/10W
R658	1-216-809-11	METAL CHIP	100	5%	1/10W
R659	1-216-809-11	METAL CHIP	100	5%	1/10W
R660	1-216-809-11	METAL CHIP	100	5%	1/10W
R661	1-216-809-11	METAL CHIP	100	5%	1/10W
R662	1-216-809-11	METAL CHIP	100	5%	1/10W
R663	1-216-809-11	METAL CHIP	100	5%	1/10W
R664	1-216-809-11	METAL CHIP	100	5%	1/10W
R665	1-216-809-11	METAL CHIP	100	5%	1/10W
R666	1-216-864-11	SHORT CHIP	0		
R667	1-216-809-11	METAL CHIP	100	5%	1/10W
R668	1-216-864-11	SHORT CHIP	0		
R669	1-216-833-11	METAL CHIP	10K	5%	1/10W
R670	1-216-833-11	METAL CHIP	10K	5%	1/10W
R671	1-216-845-11	METAL CHIP	100K	5%	1/10W
R672	1-216-833-11	METAL CHIP	10K	5%	1/10W (HX820)
R674	1-216-833-11	METAL CHIP	10K	5%	1/10W
R675	1-216-833-11	METAL CHIP	10K	5%	1/10W
R676	1-216-833-11	METAL CHIP	10K	5%	1/10W
R677	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R678	1-216-845-11	METAL CHIP	100K	5%	1/10W
R679	1-216-833-11	METAL CHIP	10K	5%	1/10W (HX825)
R681	1-216-833-11	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R683	1-216-833-11	METAL CHIP	10K	5%	1/10W
R684	1-216-864-11	SHORT CHIP	0		
R685	1-216-809-11	METAL CHIP	100	5%	1/10W
R686	1-216-809-11	METAL CHIP	100	5%	1/10W
R687	1-216-864-11	SHORT CHIP	0		
R688	1-216-864-11	SHORT CHIP	0		
R692	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R693	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R694	1-216-864-11	SHORT CHIP	0		
R696	1-216-864-11	SHORT CHIP	0		
R697	1-216-833-11	METAL CHIP	10K	5%	1/10W
R698	1-216-833-11	METAL CHIP	10K	5%	1/10W
R699	1-216-833-11	METAL CHIP	10K	5%	1/10W
R702	1-216-864-11	SHORT CHIP	0		
R705	1-216-864-11	SHORT CHIP	0		
R712	1-218-883-11	METAL CHIP	33K	0.5%	1/10W
R713	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R714	1-216-855-11	METAL CHIP	680K	5%	1/10W
R715	1-216-841-11	METAL CHIP	47K	5%	1/10W
R716	1-216-845-11	METAL CHIP	100K	5%	1/10W
R718	1-218-867-11	METAL CHIP	6.8K	0.5%	1/10W
R719	1-218-852-11	METAL CHIP	1.6K	0.5%	1/10W
R726	1-216-817-11	METAL CHIP	470	5%	1/10W
R728	1-216-840-11	METAL CHIP	39K	5%	1/10W
R729	1-216-837-11	METAL CHIP	22K	5%	1/10W
R733	1-216-864-11	SHORT CHIP	0		
R736	1-216-801-11	METAL CHIP	22	5%	1/10W
R738	1-216-801-11	METAL CHIP	22	5%	1/10W
R740	1-216-801-11	METAL CHIP	22	5%	1/10W
R742	1-216-801-11	METAL CHIP	22	5%	1/10W
R744	1-216-801-11	METAL CHIP	22	5%	1/10W
R747	1-218-285-11	METAL CHIP	75	5%	1/10W
R749	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R750	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R751	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R752	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R753	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R755	1-216-821-11	METAL CHIP	1K	5%	1/10W
R760	1-216-833-11	METAL CHIP	10K	5%	1/10W
R761	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R764	1-216-864-11	SHORT CHIP	0		
R765	1-216-864-11	SHORT CHIP	0		
R766	1-216-864-11	SHORT CHIP	0		
R767	1-216-864-11	SHORT CHIP	0		
R768	1-216-864-11	SHORT CHIP	0		
R772	1-216-833-11	METAL CHIP	10K	5%	1/10W
R776	1-218-285-11	METAL CHIP	75	5%	1/10W
R779	1-218-285-11	METAL CHIP	75	5%	1/10W
R780	1-218-285-11	METAL CHIP	75	5%	1/10W
R785	1-414-864-11	FERRITE, EMI (SMD) (1608)			
R791	1-414-864-11	FERRITE, EMI (SMD) (1608)			
R795	1-216-864-11	SHORT CHIP	0		
R798	1-216-864-11	SHORT CHIP	0		
R799	1-216-864-11	SHORT CHIP	0		
R802	1-216-845-11	METAL CHIP	100K	5%	1/10W
R803	1-216-845-11	METAL CHIP	100K	5%	1/10W
R804	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R805	1-216-845-11	METAL CHIP	100K	5%	1/10W
R806	1-216-845-11	METAL CHIP	100K	5%	1/10W
R807	1-216-845-11	METAL CHIP	100K	5%	1/10W

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Ref. No.	Part No.	Description			Remarks
R808	1-216-845-11	METAL CHIP	100K	5%	1/10W
R809	1-216-809-11	METAL CHIP	100	5%	1/10W
R810	1-216-809-11	METAL CHIP	100	5%	1/10W
R819	1-216-809-11	METAL CHIP	100	5%	1/10W
R820	1-216-809-11	METAL CHIP	100	5%	1/10W
R821	1-216-809-11	METAL CHIP	100	5%	1/10W
R822	1-216-809-11	METAL CHIP	100	5%	1/10W
R823	1-216-809-11	METAL CHIP	100	5%	1/10W
R825	1-216-809-11	METAL CHIP	100	5%	1/10W
R827	1-216-809-11	METAL CHIP	100	5%	1/10W
R828	1-216-809-11	METAL CHIP	100	5%	1/10W
R835	1-216-845-11	METAL CHIP	100K	5%	1/10W
R836	1-216-845-11	METAL CHIP	100K	5%	1/10W
R839	1-216-833-11	METAL CHIP	10K	5%	1/10W
R840	1-216-813-11	METAL CHIP	220	5%	1/10W
R841	1-216-809-11	METAL CHIP	100	5%	1/10W
R842	1-216-857-11	METAL CHIP	1M	5%	1/10W
R844	1-218-285-11	METAL CHIP	75	5%	1/10W
R845	1-218-285-11	METAL CHIP	75	5%	1/10W
R852	1-218-285-11	METAL CHIP	75	5%	1/10W
R854	1-218-285-11	METAL CHIP	75	5%	1/10W
R858	1-218-285-11	METAL CHIP	75	5%	1/10W
R859	1-216-845-11	METAL CHIP	100K	5%	1/10W
R860	1-216-809-11	METAL CHIP	100	5%	1/10W
R861	1-218-285-11	METAL CHIP	75	5%	1/10W
R862	1-216-845-11	METAL CHIP	100K	5%	1/10W
R863	1-216-809-11	METAL CHIP	100	5%	1/10W
R864	1-216-807-11	METAL CHIP	68	5%	1/10W
R865	1-218-285-11	METAL CHIP	75	5%	1/10W
R866	1-218-285-11	METAL CHIP	75	5%	1/10W
R867	1-216-845-11	METAL CHIP	100K	5%	1/10W
R868	1-218-285-11	METAL CHIP	75	5%	1/10W
R869	1-218-285-11	METAL CHIP	75	5%	1/10W
R870	1-218-285-11	METAL CHIP	75	5%	1/10W
R871	1-216-864-11	SHORT CHIP	0		
R872	1-216-864-11	SHORT CHIP	0		
R873	1-216-864-11	SHORT CHIP	0		
R874	1-216-845-11	METAL CHIP	100K	5%	1/10W
R875	1-216-845-11	METAL CHIP	100K	5%	1/10W
R876	1-216-845-11	METAL CHIP	100K	5%	1/10W
R877	1-216-845-11	METAL CHIP	100K	5%	1/10W
R878	1-216-295-91	SHORT CHIP	0		
R879	1-216-295-91	SHORT CHIP	0		
R885	1-216-845-11	METAL CHIP	100K	5%	1/10W
R886	1-216-864-11	SHORT CHIP	0		
R887	1-216-864-11	SHORT CHIP	0		
R888	1-216-845-11	METAL CHIP	100K	5%	1/10W
R889	1-216-845-11	METAL CHIP	100K	5%	1/10W
R896	1-216-817-11	METAL CHIP	470	5%	1/10W
R897	1-216-817-11	METAL CHIP	470	5%	1/10W
R898	1-216-817-11	METAL CHIP	470	5%	1/10W
R899	1-216-817-11	METAL CHIP	470	5%	1/10W
R965	1-216-864-11	SHORT CHIP	0		
R1101	1-216-821-11	METAL CHIP	1K	5%	1/10W (HX825)
R1103	1-216-821-11	METAL CHIP	1K	5%	1/10W (HX825)
R1105	1-216-821-11	METAL CHIP	1K	5%	1/10W (HX825)
R1106	1-216-825-11	METAL CHIP	2.2K	5%	1/10W (HX825)
R1107	1-216-029-00	RES-CHIP	150	5%	1/10W (HX825)
R1108	1-216-819-11	METAL CHIP	680	5%	1/10W (HX825)
R1110	1-216-821-11	METAL CHIP	1K	5%	1/10W (HX825)
R1111	1-216-821-11	METAL CHIP	1K	5%	1/10W (HX825)
R1115	1-216-864-11	SHORT CHIP	0 (HX825)		
R1116	1-216-845-11	METAL CHIP	100K	5%	1/10W (HX825)
R1120	1-216-821-11	METAL CHIP	1K	5%	1/10W (HX825)
R1132	1-216-029-00	RES-CHIP	150	5%	1/10W (HX825)
R1133	1-216-829-11	METAL CHIP	4.7K	5%	1/10W (HX825)
R1134	1-216-829-11	METAL CHIP	4.7K	5%	1/10W (HX825)
R1139	1-216-833-11	METAL CHIP	10K	5%	1/10W (HX825)
R1140	1-216-833-11	METAL CHIP	10K	5%	1/10W (HX825)
R1141	1-216-833-11	METAL CHIP	10K	5%	1/10W (HX825)
R1142	1-216-864-11	SHORT CHIP	0 (HX825)		
R1143	1-216-864-11	SHORT CHIP	0 (HX825)		
R1144	1-216-821-11	METAL CHIP	1K	5%	1/10W (HX825)
R1145	1-216-833-11	METAL CHIP	10K	5%	1/10W (HX825)
R1146	1-216-864-11	SHORT CHIP	0 (HX825)		
R1147	1-216-829-11	METAL CHIP	4.7K	5%	1/10W (HX825)
R1148	1-216-029-00	RES-CHIP	150	5%	1/10W (HX825)
R1401	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1402	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R1403	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1406	1-216-809-11	METAL CHIP	100	5%	1/10W
R1407	1-216-819-11	METAL CHIP	680	5%	1/10W
R1408	1-216-809-11	METAL CHIP	100	5%	1/10W
R1409	1-216-809-11	METAL CHIP	100	5%	1/10W
R1410	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1411	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1412	1-216-846-11	METAL CHIP	120K	5%	1/10W
R1416	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1417	1-216-864-11	SHORT CHIP	0		
R1418	1-216-864-11	SHORT CHIP	0		
R1419	1-216-864-11	SHORT CHIP	0		
R1451	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1452	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R1453	1-218-905-11	METAL CHIP	270K	0.5%	1/10W
R1454	1-218-885-11	METAL CHIP	39K	0.5%	1/10W
R1601	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1602	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1603	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1604	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1609	1-216-847-11	METAL CHIP	150K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R1610	1-216-809-11	METAL CHIP	100	5%	1/10W
R1613	1-216-837-11	METAL CHIP	22K	5%	1/10W
R1614	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1621	1-216-839-11	METAL CHIP	33K	5%	1/10W
R1622	1-216-864-11	SHORT CHIP	0		
R1623	1-216-864-11	SHORT CHIP	0		
R1624	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1625	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1626	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1627	1-216-864-11	SHORT CHIP	0		
R1628	1-216-845-11	METAL CHIP	100K	5%	1/10W
R1629	1-216-817-11	METAL CHIP	470	5%	1/10W
R1630	1-216-817-11	METAL CHIP	470	5%	1/10W
R1632	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1633	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1636	1-216-809-11	METAL CHIP	100	5%	1/10W
R1637	1-216-809-11	METAL CHIP	100	5%	1/10W
R1638	1-216-809-11	METAL CHIP	100	5%	1/10W
R1707	1-216-295-91	SHORT CHIP	0		
R1709	1-216-295-91	SHORT CHIP	0		
R1710	1-216-864-11	SHORT CHIP	0		
R1714	1-216-817-11	METAL CHIP	470	5%	1/10W
R1715	1-216-864-11	SHORT CHIP	0		
R1716	1-218-285-11	METAL CHIP	75	5%	1/10W
R1717	1-218-285-11	METAL CHIP	75	5%	1/10W
R1718	1-216-864-11	SHORT CHIP	0		
R1719	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1720	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1721	1-216-864-11	SHORT CHIP	0		
R1722	1-216-864-11	SHORT CHIP	0		
R1735	1-216-817-11	METAL CHIP	470	5%	1/10W
R1736	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1738	1-216-864-11	SHORT CHIP	0		
R1800	1-216-809-11	METAL CHIP	100	5%	1/10W
R1801	1-216-864-11	SHORT CHIP	0		
		< THERMISTOR >			
TH601	1-805-074-11	THERMISTOR			
		< TUNER UNIT >			
⚠TU401	8-597-559-00	TUNER, FSS BTF-DF441			
		< VIBRATOR >			
* X602	1-813-700-21	VIBRATOR, CRYSTAL (10MHz)			
* X603	1-813-698-11	VIBRATOR, CRYSTAL (32.768kHz)			
X1101	1-781-589-21	VIBRATOR, CRYSTAL (HX825)			
* X1401	1-813-713-31	VIBRATOR, CRYSTAL (18.432MHZ)			
		FL-166 BOARD, COMPLETE			
		**********			
		(Ref.No.;30,000 SERIES)			
		< CAPACITOR >			
C3103	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C3104	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C3106	1-125-972-91	ELECT	100uF	20%	16V
C3110	1-106-363-00	MYLAR	0.0068uF	5%	200V
C3113	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V

Ref. No.	Part No.	Description			Remarks
C3114	1-128-131-11	ELECT	22uF	20%	50V
C3115	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C3116	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C3117	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C3118	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C3120	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C3121	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C3124	1-216-864-11	SHORT CHIP	0		
		< CONNECTOR >			
CN3101	1-774-729-21	PIN, CONNECTOR (PC BOARD) 10P			
		< DIODE >			
D3102	8-719-067-40	DIODE STZ6.8N-T146			
D3103	8-719-067-40	DIODE STZ6.8N-T146			
D3104	8-719-067-40	DIODE STZ6.8N-T146			
D3105	8-719-067-40	DIODE STZ6.8N-T146			
D3106	8-719-067-40	DIODE STZ6.8N-T146			
D3107	8-719-067-40	DIODE STZ6.8N-T146			
D3108	8-719-988-61	DIODE 1SS355TE-17			
D3109	8-719-988-61	DIODE 1SS355TE-17			
D3110	8-719-988-61	DIODE 1SS355TE-17			
D3111	8-719-988-61	DIODE 1SS355TE-17			
D3112	8-719-056-82	DIODE UDZ-TE-17-6.2B			
		< FERRITE BEAD >			
FB3101	1-414-228-11	INDUCTOR, FERRITE BEAD			
FB3102	1-414-228-11	INDUCTOR, FERRITE BEAD			
		< IC >			
IC3101	8-759-643-83	IC uPD16315GB-3BS			
		< JACK >			
J3101	1-780-049-11	TERMINAL BOARD (S TERMINAL+3P)			
		< COIL >			
L3101	1-412-537-31	INDUCTOR	100uH		
		< FLUORESCENT INDICATOR TUBE >			
* ND3101	1-519-849-21	INDICATOR TUBE, FLUORESCENT			
		< TRANSISTOR >			
Q3101	8-729-901-88	TRANSISTOR	2SC2411K-CR		
Q3102	8-729-901-88	TRANSISTOR	2SC2411K-CR		
		< RESISTOR >			
R3101	1-218-285-11	METAL CHIP	75	5%	1/10W
R3102	1-218-285-11	METAL CHIP	75	5%	1/10W
R3103	1-216-864-11	SHORT CHIP	0		
R3104	1-216-864-11	SHORT CHIP	0		
R3105	1-216-864-11	SHORT CHIP	0		
R3108	1-218-285-11	METAL CHIP	75	5%	1/10W
R3109	1-216-864-11	SHORT CHIP	0		
R3111	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R3113	1-216-849-11	METAL CHIP	220K	5%	1/10W
R3114	1-216-849-11	METAL CHIP	220K	5%	1/10W

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
R3115	1-216-838-11	METAL CHIP	27K	5%	1/10W
R3116	1-216-845-11	METAL CHIP	100K	5%	1/10W
		< SWITCH >			
S3101	1-771-410-21	SWITCH, TACTILE			
		< TRANSFORMER >			
* T3101	1-445-017-11	TRANSFORMER, DC-DC CONVERTER (POWER)			
		FR-257 BOARD, COMPLETE			
		**********			
		(Ref.No.;30,000 SERIES)			
		< CAPACITOR >			
C3001	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C3002	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C3004	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
		< CONNECTOR >			
CN3004	1-785-828-21	CONNECTOR, SQUARE TYPE 4P (DV IN)			
* CN3005	1-580-789-22	PIN, CONNECTOR (SMD) 6P			
		< DIODE >			
D3001	8-719-067-40	DIODE STZ6.8N-T146			
D3002	8-719-077-79	DIODE SLR-332VRT32 (SYNCHRO REC)			
D3003	8-719-077-79	DIODE SLR-332VRT32 (TIMER REC)			
D3004	6-500-176-01	DIODE EB3804X-TP-J555K (HDD)			
D3005	8-719-084-27	DIODE SLI-343YCT32WST (DVD)			
		< IC >			
IC3001	6-706-783-01	IC BU2050F-E2			
* IC3002	6-600-500-01	IC GP1UM28XK0SF			
		< TRANSISTOR >			
Q3001	8-729-421-22	TRANSISTOR	UN2211		
Q3002	8-729-010-05	TRANSISTOR	MSB709-RT1		
		< RESISTOR >			
R3001	1-216-295-91	SHORT CHIP	0		
R3003	1-216-864-11	SHORT CHIP	0		
R3004	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R3005	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3006	1-216-813-11	METAL CHIP	220	5%	1/10W
R3007	1-216-813-11	METAL CHIP	220	5%	1/10W
R3008	1-216-864-11	SHORT CHIP	0		
R3009	1-216-806-11	METAL CHIP	56	5%	1/10W
R3010	1-216-811-11	METAL CHIP	150	5%	1/10W
R3012	1-216-864-11	SHORT CHIP	0		
R3013	1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W
R3014	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3015	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R3016	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R3017	1-216-832-11	METAL CHIP	8.2K	5%	1/10W
R3018	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3019	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3020	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R3023	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3024	1-216-825-11	METAL CHIP	2.2K	5%	1/10W

Ref. No.	Part No.	Description	Remarks
		< SWITCH >	
S3001	1-771-410-21	SWITCH, TACTILE (PLAY)	
S3002	1-771-410-21	SWITCH, TACTILE (REC STOP)	
S3003	1-771-410-21	SWITCH, TACTILE (REC)	
S3004	1-771-410-21	SWITCH, TACTILE (STOP)	
S3005	1-771-410-21	SWITCH, TACTILE (DUB)	
S3006	1-771-410-21	SWITCH, TACTILE (OPEN/CLOSE)	
S3007	1-771-410-21	SWITCH, TACTILE (CH+)	
S3008	1-771-410-21	SWITCH, TACTILE (CH-)	
S3009	1-771-410-21	SWITCH, TACTILE (REC MODE)	
S3012	1-771-410-21	SWITCH, TACTILE (DVD)	
S3013	1-771-410-21	SWITCH, TACTILE (HDD)	
S3014	1-771-410-21	SWITCH, TACTILE (INPUT SELECT)	
*	A-1494-643-A	RD-064 BOARD, COMPLETE (SERVICE) (HX820)	
*	A-1215-024-A	RD-064 BOARD, COMPLETE (SERVICE) (HX825)	
		(Ref.No.;20,000 SERIES)	
		< CAPACITOR >	

C101	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C102	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C103	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C104	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C107	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C109	1-126-246-11	ELECT CHIP	220uF	20%	4V
C110	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C111	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C112	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C113	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C114	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C115	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C116	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C117	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C118	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C119	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C120	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C121	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C122	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C123	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C124	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C125	1-128-994-21	ELECT CHIP	47uF	20%	10V
C126	1-126-209-11	ELECT CHIP	100uF	20%	4V
C127	1-128-994-21	ELECT CHIP	47uF	20%	10V
C128	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C129	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C130	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C131	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C132	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C133	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C134	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C135	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C136	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C137	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C138	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C139	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C140	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C141	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C142	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C143	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V

Ref. No.	Part No.	Description			Remarks
C144	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C145	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C146	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C147	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C148	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C149	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C150	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C151	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C152	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C153	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C154	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C155	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C156	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C157	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C158	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C159	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C160	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C161	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C162	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C163	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C164	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C165	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C166	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C167	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C168	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C169	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C170	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C171	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C172	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C173	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C174	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C175	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C176	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C177	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C188	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C189	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C190	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C191	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C192	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C193	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C194	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C195	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C196	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C197	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C198	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C199	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C201	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C202	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C203	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C204	1-164-852-11	CERAMIC CHIP	12PF	5%	50V
C205	1-164-852-11	CERAMIC CHIP	12PF	5%	50V
C206	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C207	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C208	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C209	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C210	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C214	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C215	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C217	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C218	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C219	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C220	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C222	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C223	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C224	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C230	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C231	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C232	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C233	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C234	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C235	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C236	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C237	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C301	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C302	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C303	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C304	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C305	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C308	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C309	1-164-882-11	CERAMIC CHIP	220PF	5%	16V
C310	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C311	1-164-882-11	CERAMIC CHIP	220PF	5%	16V
C312	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C313	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C314	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C315	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C316	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C317	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C318	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C319	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C320	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C321	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C322	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C323	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C324	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C325	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C326	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C327	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C328	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C329	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C330	1-164-849-11	CERAMIC CHIP	9PF	0.5PF	50V
C331	1-164-849-11	CERAMIC CHIP	9PF	0.5PF	50V
C332	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C333	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C334	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C335	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C336	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C337	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C338	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C339	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C340	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C501	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C502	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C505	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C506	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C601	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C602	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C603	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C604	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C605	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V

Ref. No.	Part No.	Description			Remarks
C606	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C607	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C608	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C609	1-128-994-21	ELECT CHIP	47uF	20%	10V
C610	1-128-994-21	ELECT CHIP	47uF	20%	10V
C611	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C612	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C614	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C615	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C616	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C617	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C618	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C619	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C620	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C622	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C623	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C625	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C626	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C701	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C702	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C703	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C704	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C705	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C706	1-164-849-11	CERAMIC CHIP	9PF	0.5PF	50V
C707	1-164-849-11	CERAMIC CHIP	9PF	0.5PF	50V
C708	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C710	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C711	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C712	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C713	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C714	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C715	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C716	1-112-001-81	CERAMIC CHIP	270PF	5%	50V
C803	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C804	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C805	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C806	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C807	1-164-852-11	CERAMIC CHIP	12PF	5%	50V
C808	1-164-852-11	CERAMIC CHIP	12PF	5%	50V
C809	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C810	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C811	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C812	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C813	1-124-779-00	ELECT CHIP	10uF	20%	16V
C816	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C817	1-128-994-21	ELECT CHIP	47uF	20%	10V
C901	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C902	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C903	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C904	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C905	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C906	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C907	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C908	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C909	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C910	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C911	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C912	1-128-993-21	ELECT CHIP	22uF	20%	10V
C913	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C914	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C915	1-128-934-91	CERAMIC CHIP	0.33uF	20%	10V
C916	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C917	1-127-772-81	CERAMIC CHIP	33000PF	10%	10V
C918	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C919	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C920	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C921	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C922	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C923	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C924	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C925	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C926	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C927	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C928	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C929	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C930	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C931	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C932	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C933	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C934	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C935	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C936	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C937	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C938	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C939	1-128-993-21	ELECT CHIP	22uF	20%	10V
C940	1-128-993-21	ELECT CHIP	22uF	20%	10V
C941	1-124-779-00	ELECT CHIP	10uF	20%	16V
C942	1-124-779-00	ELECT CHIP	10uF	20%	16V
C944	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C945	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C946	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C947	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C948	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C949	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C950	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C952	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C953	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C954	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C955	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C956	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C957	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C1006	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C1008	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1009	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1011	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1012	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1013	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1014	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1015	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1028	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1029	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1030	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1031	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1032	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1033	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C1034	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C1035	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C1036	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1037	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V

Ref. No.	Part No.	Description			Remarks
* C1038	1-112-833-11	ELECT CHIP	68uF	20%	16V
C1041	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
		< CONNECTOR >			
CN201	1-818-857-51	CONNECTOR, FFC/FPC 40P			
CN603	1-818-858-11	CONNECTOR, BOAD TO BOAD 42P			
CN606	1-818-858-11	CONNECTOR, BOAD TO BOAD 42P			
CN701	1-573-806-21	PIN, CONNECTOR (1.5MM) (SMD) 6P			
* CN901	1-691-591-11	PIN, CONNECTOR (1.5MM) (SMD) 8P			
CN902	1-820-747-11	CONNECTOR, HDMI			
		< DIODE >			
D915	8-719-069-56	DIODE UDZSTE-176.2B			
		< FERRITE BEAD >			
FB101	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB103	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB106	1-469-670-21	FERRITE, EMI (SMD) (2012)			
FB107	1-469-670-21	FERRITE, EMI (SMD) (2012)			
FB110	1-469-670-21	FERRITE, EMI (SMD) (2012)			
FB111	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB112	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB602	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB603	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB604	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB605	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB606	1-469-084-21	FERRITE	0mH		
		< FILTER >			
FL501	1-234-867-11	FILTER, EMI REMOVAL (SMD)			
FL702	1-234-867-11	FILTER, EMI REMOVAL (SMD)			
FL801	1-234-867-11	FILTER, EMI REMOVAL (SMD)			
FL902	1-234-177-21	FILTER, CHIP EMI			
FL904	1-234-177-21	FILTER, CHIP EMI			
FL905	1-234-177-21	FILTER, CHIP EMI			
FL906	1-234-177-21	FILTER, CHIP EMI			
FL907	1-234-177-21	FILTER, CHIP EMI			
		< IC >			
IC101	6-702-302-01	IC TK11133CSCL-G			
IC103	6-708-896-01	IC R8A34012BG			
IC105	6-708-812-01	IC HYB25DC512160CE-6			
IC106	6-708-812-01	IC HYB25DC512160CE-6			
IC108	6-708-935-01	IC MM1762FHBE			
IC109	6-702-302-01	IC TK11133CSCL-G			
IC112	6-704-353-01	IC SN74LVC2G34DCKR			
IC201	6-806-103-01	IC 88SA8040-TBC1C000			
IC202	6-705-311-01	IC S-T111B18MC-OGDTFG			
* IC301	6-708-848-01	IC TVP5146M2PFP			
IC302	6-708-882-01	IC BH18MA3WHFV-TR			
IC502	6-708-924-01	IC S29GL256N90TFIR20			
IC601	6-708-889-01	IC MP2105DJ-LF-Z			
IC602	6-706-237-01	IC PQ1MX55M2SPQ			
IC604	8-759-660-23	IC SN74HCT08APWR			
IC605	8-759-548-99	IC SN74LV08APWR			
IC701	6-706-365-01	IC uPD72852AGB-8EU-A			
* IC802	6-708-929-01	IC ICS650G-42LFT			
IC803	6-708-888-01	IC WM8590GEDS/RV			
IC901	8-759-837-19	IC MM1562FFBE			

Ref. No.	Part No.	Description			Remarks
IC902	6-706-520-01	IC CXD9836R			
IC903	6-806-931-01	IC MB95F108ASPFV-GE1-5G00			
IC906	6-703-046-01	IC SN74LVC1G08DCKR			
IC907	6-707-119-01	IC TK11218CMCL-G			
IC908	6-704-470-01	IC TK11233CMCL-G			
IC909	6-702-302-01	IC TK11133CSCL-G			
IC910	6-710-105-01	IC TK70550SCL-G			
		< COIL >			
L101	1-469-555-21	INDUCTOR	10uH		
L102	1-469-555-21	INDUCTOR	10uH		
L201	1-469-555-21	INDUCTOR	10uH		
L202	1-469-555-21	INDUCTOR	10uH		
L301	1-469-555-21	INDUCTOR	10uH		
L302	1-469-555-21	INDUCTOR	10uH		
L303	1-469-555-21	INDUCTOR	10uH		
L602	1-400-073-21	INDUCTOR	4.7uH		
L603	1-469-555-21	INDUCTOR	10uH		
L604	1-469-555-21	INDUCTOR	10uH		
		< TRANSISTOR >			
Q601	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q602	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q603	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q604	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q605	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q606	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q607	8-729-010-05	TRANSISTOR	MSB709-RT1		
		< RESISTOR >			
R103	1-218-939-11	RES-CHIP	68	5%	1/16W
R104	1-218-939-11	RES-CHIP	68	5%	1/16W
R105	1-218-965-11	RES-CHIP	10K	5%	1/16W
R108	1-218-965-11	RES-CHIP	10K	5%	1/16W
R109	1-218-965-11	RES-CHIP	10K	5%	1/16W
R110	1-218-965-11	RES-CHIP	10K	5%	1/16W
R111	1-218-965-11	RES-CHIP	10K	5%	1/16W
R112	1-218-965-11	RES-CHIP	10K	5%	1/16W
R113	1-218-953-11	RES-CHIP	1K	5%	1/16W
R117	1-218-990-81	SHORT CHIP	0		
R118	1-218-990-81	SHORT CHIP	0		
R119	1-218-937-11	RES-CHIP	47	5%	1/16W
R120	1-218-933-11	RES-CHIP	22	5%	1/16W
R121	1-218-990-81	SHORT CHIP	0		
R122	1-218-990-81	SHORT CHIP	0		
R123	1-218-965-11	RES-CHIP	10K	5%	1/16W
R124	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R125	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R126	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R127	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R128	1-218-990-81	SHORT CHIP	0		
R129	1-218-935-11	RES-CHIP	33	5%	1/16W
R130	1-218-990-81	SHORT CHIP	0		
R131	1-218-933-11	RES-CHIP	22	5%	1/16W
R132	1-218-933-11	RES-CHIP	22	5%	1/16W
R133	1-218-990-81	SHORT CHIP	0		
R134	1-218-933-11	RES-CHIP	22	5%	1/16W
R135	1-218-990-81	SHORT CHIP	0		
R136	1-218-990-81	SHORT CHIP	0		
R137	1-218-973-11	RES-CHIP	47K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R138	1-218-973-11	RES-CHIP	47K	5%	1/16W
R139	1-218-973-11	RES-CHIP	47K	5%	1/16W
R140	1-218-973-11	RES-CHIP	47K	5%	1/16W
R141	1-218-973-11	RES-CHIP	47K	5%	1/16W
R142	1-218-973-11	RES-CHIP	47K	5%	1/16W
R143	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R145	1-218-973-11	RES-CHIP	47K	5%	1/16W
R146	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R147	1-218-933-11	RES-CHIP	22	5%	1/16W
R148	1-218-933-11	RES-CHIP	22	5%	1/16W
R149	1-218-939-11	RES-CHIP	68	5%	1/16W
R150	1-218-933-11	RES-CHIP	22	5%	1/16W
R153	1-218-965-11	RES-CHIP	10K	5%	1/16W
R154	1-218-933-11	RES-CHIP	22	5%	1/16W
R155	1-218-965-11	RES-CHIP	10K	5%	1/16W
R156	1-218-937-11	RES-CHIP	47	5%	1/16W
R157	1-218-933-11	RES-CHIP	22	5%	1/16W
R158	1-218-933-11	RES-CHIP	22	5%	1/16W
R160	1-218-990-81	SHORT CHIP	0		
R161	1-218-990-81	SHORT CHIP	0		
R162	1-208-687-11	METAL CHIP	1.5K	0.5%	1/16W
R163	1-208-687-11	METAL CHIP	1.5K	0.5%	1/16W
R164	1-208-643-11	METAL CHIP	22	0.5%	1/16W
R165	1-208-643-11	METAL CHIP	22	0.5%	1/16W
R166	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R167	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R168	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R169	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R170	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R171	1-218-933-11	RES-CHIP	22	5%	1/16W
R172	1-218-933-11	RES-CHIP	22	5%	1/16W
R173	1-218-933-11	RES-CHIP	22	5%	1/16W
R174	1-218-933-11	RES-CHIP	22	5%	1/16W
R175	1-218-933-11	RES-CHIP	22	5%	1/16W
R176	1-218-933-11	RES-CHIP	22	5%	1/16W
R177	1-218-933-11	RES-CHIP	22	5%	1/16W
R178	1-218-933-11	RES-CHIP	22	5%	1/16W
R179	1-218-933-11	RES-CHIP	22	5%	1/16W
R180	1-218-965-11	RES-CHIP	10K	5%	1/16W
R181	1-218-965-11	RES-CHIP	10K	5%	1/16W
R182	1-218-945-11	RES-CHIP	220	5%	1/16W
R183	1-218-945-11	RES-CHIP	220	5%	1/16W
R184	1-218-933-11	RES-CHIP	22	5%	1/16W
R185	1-218-933-11	RES-CHIP	22	5%	1/16W
R186	1-218-933-11	RES-CHIP	22	5%	1/16W
R187	1-218-933-11	RES-CHIP	22	5%	1/16W
R188	1-218-937-11	RES-CHIP	47	5%	1/16W
R189	1-218-933-11	RES-CHIP	22	5%	1/16W
R190	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R191	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R192	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R193	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R194	1-218-933-11	RES-CHIP	22	5%	1/16W
R195	1-218-933-11	RES-CHIP	22	5%	1/16W
R196	1-218-953-11	RES-CHIP	1K	5%	1/16W
R197	1-216-864-11	SHORT CHIP	0		
R198	1-218-933-11	RES-CHIP	22	5%	1/16W
R199	1-218-990-81	SHORT CHIP	0		
R203	1-218-990-81	SHORT CHIP	0		
R204	1-218-941-81	RES-CHIP	100	5%	1/16W
R205	1-218-990-81	SHORT CHIP	0		
R206	1-218-990-81	SHORT CHIP	0		
R207	1-218-941-81	RES-CHIP	100	5%	1/16W
R208	1-218-990-81	SHORT CHIP	0		
R209	1-218-941-81	RES-CHIP	100	5%	1/16W
R210	1-218-938-11	RES-CHIP	56	5%	1/16W
R211	1-218-965-11	RES-CHIP	10K	5%	1/16W
R212	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R213	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R214	1-218-938-11	RES-CHIP	56	5%	1/16W
R223	1-218-940-11	RES-CHIP	82	5%	1/16W
R224	1-218-933-11	RES-CHIP	22	5%	1/16W
R225	1-218-940-11	RES-CHIP	82	5%	1/16W
R226	1-218-940-11	RES-CHIP	82	5%	1/16W
R227	1-218-933-11	RES-CHIP	22	5%	1/16W
R228	1-218-940-11	RES-CHIP	82	5%	1/16W
R229	1-218-933-11	RES-CHIP	22	5%	1/16W
R231	1-218-940-11	RES-CHIP	82	5%	1/16W
R233	1-218-953-11	RES-CHIP	1K	5%	1/16W
R237	1-216-864-11	SHORT CHIP	0		
R238	1-218-953-11	RES-CHIP	1K	5%	1/16W
R240	1-218-965-11	RES-CHIP	10K	5%	1/16W
R243	1-218-953-11	RES-CHIP	1K	5%	1/16W
R245	1-218-949-11	RES-CHIP	470	5%	1/16W
R246	1-218-989-11	RES-CHIP	1M	5%	1/16W
R247	1-218-953-11	RES-CHIP	1K	5%	1/16W
R248	1-208-709-11	METAL CHIP	12K	0.5%	1/16W
R249	1-218-941-11	RES-CHIP	100	5%	1/16W
R250	1-216-864-11	SHORT CHIP	0		
R252	1-216-864-11	SHORT CHIP	0		
R258	1-218-953-11	RES-CHIP	1K	5%	1/16W
R261	1-218-965-11	RES-CHIP	10K	5%	1/16W
R265	1-218-965-11	RES-CHIP	10K	5%	1/16W
R267	1-218-953-11	RES-CHIP	1K	5%	1/16W
R269	1-218-953-11	RES-CHIP	1K	5%	1/16W
R270	1-218-953-11	RES-CHIP	1K	5%	1/16W
R272	1-218-953-11	RES-CHIP	1K	5%	1/16W
R274	1-218-965-11	RES-CHIP	10K	5%	1/16W
R276	1-218-953-11	RES-CHIP	1K	5%	1/16W
R279	1-218-990-81	SHORT CHIP	0		
R282	1-218-990-81	SHORT CHIP	0		
R303	1-218-933-11	RES-CHIP	22	5%	1/16W
R304	1-218-933-11	RES-CHIP	22	5%	1/16W
R305	1-218-933-11	RES-CHIP	22	5%	1/16W
R306	1-218-933-11	RES-CHIP	22	5%	1/16W
R307	1-218-933-11	RES-CHIP	22	5%	1/16W
R308	1-218-990-81	SHORT CHIP	0		
R312	1-218-990-81	SHORT CHIP	0		
R313	1-218-990-81	SHORT CHIP	0		
R314	1-218-977-11	RES-CHIP	100K	5%	1/16W
R315	1-218-933-11	RES-CHIP	22	5%	1/16W
R316	1-218-941-81	RES-CHIP	100	5%	1/16W
R317	1-218-933-11	RES-CHIP	22	5%	1/16W
R318	1-218-941-81	RES-CHIP	100	5%	1/16W
R322	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R323	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R325	1-218-941-81	RES-CHIP	100	5%	1/16W
R328	1-218-965-11	RES-CHIP	10K	5%	1/16W
R329	1-218-990-81	SHORT CHIP	0		
R336	1-218-965-11	RES-CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R337	1-218-965-11	RES-CHIP	10K	5%	1/16W
R338	1-218-990-81	SHORT CHIP	0		
R513	1-218-965-11	RES-CHIP	10K	5%	1/16W
R518	1-218-965-11	RES-CHIP	10K	5%	1/16W
R519	1-218-965-11	RES-CHIP	10K	5%	1/16W
R522	1-218-990-81	SHORT CHIP	0		
R524	1-218-990-81	SHORT CHIP	0		
R525	1-218-990-81	SHORT CHIP	0		
R532	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R533	1-218-990-81	SHORT CHIP	0		
R535	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R547	1-218-990-81	SHORT CHIP	0		
R549	1-218-990-81	SHORT CHIP	0		
R565	1-218-941-81	RES-CHIP	100	5%	1/16W
R603	1-218-942-11	RES-CHIP	120	5%	1/16W
R605	1-218-942-11	RES-CHIP	120	5%	1/16W
R607	1-218-942-11	RES-CHIP	120	5%	1/16W
R609	1-218-942-11	RES-CHIP	120	5%	1/16W
R611	1-218-942-11	RES-CHIP	120	5%	1/16W
R612	1-218-951-11	RES-CHIP	680	5%	1/16W
R613	1-218-990-81	SHORT CHIP	0		
R614	1-218-951-11	RES-CHIP	680	5%	1/16W
R615	1-218-990-81	SHORT CHIP	0		
R616	1-218-990-81	SHORT CHIP	0		
R617	1-218-951-11	RES-CHIP	680	5%	1/16W
R618	1-218-951-11	RES-CHIP	680	5%	1/16W
R619	1-218-990-81	SHORT CHIP	0		
R620	1-218-990-81	SHORT CHIP	0		
R621	1-218-951-11	RES-CHIP	680	5%	1/16W
R623	1-208-952-81	METAL CHIP	510K	0.5%	1/16W
R624	1-208-955-11	METAL CHIP	680K	0.5%	1/16W
R626	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R627	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R628	1-216-864-11	SHORT CHIP	0		
R629	1-216-864-11	SHORT CHIP	0		
R630	1-216-797-11	METAL CHIP	10	5%	1/10W
R631	1-218-965-11	RES-CHIP	10K	5%	1/16W
R635	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R638	1-218-990-81	SHORT CHIP	0		
R639	1-218-933-11	RES-CHIP	22	5%	1/16W
R640	1-218-990-81	SHORT CHIP	0		
R641	1-218-933-11	RES-CHIP	22	5%	1/16W
R642	1-218-965-11	RES-CHIP	10K	5%	1/16W
R643	1-218-990-81	SHORT CHIP	0		
R644	1-218-990-81	SHORT CHIP	0		
R645	1-218-990-81	SHORT CHIP	0		
R646	1-218-990-81	SHORT CHIP	0		
R647	1-218-949-11	RES-CHIP	470	5%	1/16W
R649	1-218-941-81	RES-CHIP	100	5%	1/16W
R650	1-218-949-11	RES-CHIP	470	5%	1/16W
R652	1-218-941-81	RES-CHIP	100	5%	1/16W
R655	1-218-990-81	SHORT CHIP	0		
R658	1-216-821-11	METAL CHIP	1K	5%	1/10W
R661	1-218-990-81	SHORT CHIP	0		
R662	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R663	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R664	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R665	1-216-864-11	SHORT CHIP	0		
R666	1-216-864-11	SHORT CHIP	0		
R701	1-216-864-11	SHORT CHIP	0		
R703	1-218-935-11	RES-CHIP	33	5%	1/16W
R705	1-218-965-11	RES-CHIP	10K	5%	1/16W
R706	1-218-953-11	RES-CHIP	1K	5%	1/16W
R709	1-218-941-81	RES-CHIP	100	5%	1/16W
R710	1-218-965-11	RES-CHIP	10K	5%	1/16W
R711	1-218-965-11	RES-CHIP	10K	5%	1/16W
R712	1-218-965-11	RES-CHIP	10K	5%	1/16W
R713	1-218-965-11	RES-CHIP	10K	5%	1/16W
R714	1-218-965-11	RES-CHIP	10K	5%	1/16W
R715	1-218-965-11	RES-CHIP	10K	5%	1/16W
R717	1-208-910-11	METAL CHIP	9.1K	0.5%	1/16W
R718	1-218-938-11	RES-CHIP	56	5%	1/16W
R719	1-218-938-11	RES-CHIP	56	5%	1/16W
R721	1-218-938-11	RES-CHIP	56	5%	1/16W
R722	1-218-938-11	RES-CHIP	56	5%	1/16W
R723	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R733	1-218-990-81	SHORT CHIP	0		
R808	1-218-935-11	RES-CHIP	33	5%	1/16W
R810	1-218-933-11	RES-CHIP	22	5%	1/16W
R811	1-218-965-11	RES-CHIP	10K	5%	1/16W
R812	1-218-965-11	RES-CHIP	10K	5%	1/16W
R816	1-218-937-11	RES-CHIP	47	5%	1/16W
R817	1-218-935-11	RES-CHIP	33	5%	1/16W
R821	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R823	1-218-935-11	RES-CHIP	33	5%	1/16W
R825	1-218-933-11	RES-CHIP	22	5%	1/16W
R826	1-218-935-11	RES-CHIP	33	5%	1/16W
R827	1-218-935-11	RES-CHIP	33	5%	1/16W
R830	1-218-933-11	RES-CHIP	22	5%	1/16W
R839	1-218-990-81	SHORT CHIP	0		
R840	1-218-990-81	SHORT CHIP	0		
R841	1-218-990-81	SHORT CHIP	0		
R842	1-218-990-81	SHORT CHIP	0		
R844	1-218-990-81	SHORT CHIP	0		
R845	1-218-990-81	SHORT CHIP	0		
R846	1-218-933-11	RES-CHIP	22	5%	1/16W
R847	1-218-933-11	RES-CHIP	22	5%	1/16W
R901	1-218-990-81	SHORT CHIP	0		
R902	1-218-939-11	RES-CHIP	68	5%	1/16W
R905	1-218-990-81	SHORT CHIP	0		
R906	1-218-990-81	SHORT CHIP	0		
R907	1-218-990-81	SHORT CHIP	0		
R913	1-218-990-81	SHORT CHIP	0		
R914	1-218-990-81	SHORT CHIP	0		
R915	1-218-990-81	SHORT CHIP	0		
R918	1-218-990-81	SHORT CHIP	0		
R919	1-218-990-81	SHORT CHIP	0		
R921	1-218-953-11	RES-CHIP	1K	5%	1/16W
R922	1-218-953-11	RES-CHIP	1K	5%	1/16W
R923	1-218-953-11	RES-CHIP	1K	5%	1/16W
R924	1-218-933-11	RES-CHIP	22	5%	1/16W
R925	1-218-933-11	RES-CHIP	22	5%	1/16W
R926	1-218-977-11	RES-CHIP	100K	5%	1/16W
R927	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R928	1-218-952-11	RES-CHIP	820	5%	1/16W
R929	1-218-965-11	RES-CHIP	10K	5%	1/16W
R930	1-218-941-81	RES-CHIP	100	5%	1/16W
R931	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R932	1-218-990-81	SHORT CHIP	0		
R933	1-218-990-81	SHORT CHIP	0		

Ref. No.	Part No.	Description			Remarks
R935	1-218-941-81	RES-CHIP	100	5%	1/16W
R937	1-218-990-81	SHORT CHIP	0		
R938	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R939	1-218-990-81	SHORT CHIP	0		
R940	1-218-965-11	RES-CHIP	10K	5%	1/16W
R941	1-218-990-81	SHORT CHIP	0		
R942	1-218-990-81	SHORT CHIP	0		
R945	1-218-937-11	RES-CHIP	47	5%	1/16W
R946	1-218-941-81	RES-CHIP	100	5%	1/16W
R948	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R950	1-218-953-11	RES-CHIP	1K	5%	1/16W
R951	1-218-953-11	RES-CHIP	1K	5%	1/16W
R953	1-218-965-11	RES-CHIP	10K	5%	1/16W
R954	1-218-965-11	RES-CHIP	10K	5%	1/16W
R955	1-218-965-11	RES-CHIP	10K	5%	1/16W
R956	1-218-965-11	RES-CHIP	10K	5%	1/16W
R957	1-218-965-11	RES-CHIP	10K	5%	1/16W
R968	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R973	1-218-990-81	SHORT CHIP	0		
R974	1-218-990-81	SHORT CHIP	0		
R977	1-218-990-81	SHORT CHIP	0		
R978	1-218-990-81	SHORT CHIP	0		
R983	1-218-990-81	SHORT CHIP	0		
R985	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R986	1-218-990-81	SHORT CHIP	0		
R987	1-218-990-81	SHORT CHIP	0		
R988	1-218-937-11	RES-CHIP	47	5%	1/16W
R989	1-218-937-11	RES-CHIP	47	5%	1/16W
R990	1-218-941-81	RES-CHIP	100	5%	1/16W
R991	1-218-953-11	RES-CHIP	1K	5%	1/16W
R993	1-218-953-11	RES-CHIP	1K	5%	1/16W
R994	1-218-965-11	RES-CHIP	10K	5%	1/16W
R995	1-220-179-11	RES-CHIP	510	5%	1/16W
R1001	1-218-935-11	RES-CHIP	33	5%	1/16W
R1002	1-218-990-81	SHORT CHIP	0		
R1003	1-218-990-81	SHORT CHIP	0		
R1004	1-218-990-81	SHORT CHIP	0		
R1005	1-218-933-11	RES-CHIP	22	5%	1/16W
R1006	1-218-933-11	RES-CHIP	22	5%	1/16W
R1007	1-218-933-11	RES-CHIP	22	5%	1/16W
R1008	1-218-990-81	SHORT CHIP	0		
R1009	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1010	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1011	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R1012	1-218-990-81	SHORT CHIP	0		
R1014	1-218-990-81	SHORT CHIP	0		
R1015	1-218-990-81	SHORT CHIP	0		
R1016	1-218-990-81	SHORT CHIP	0		
R1017	1-218-990-81	SHORT CHIP	0		
R1018	1-218-990-81	SHORT CHIP	0		
R1019	1-218-990-81	SHORT CHIP	0		
R1020	1-218-990-81	SHORT CHIP	0		
R1021	1-218-990-81	SHORT CHIP	0		
R1022	1-218-933-11	RES-CHIP	22	5%	1/16W
R1023	1-218-933-11	RES-CHIP	22	5%	1/16W
R1024	1-218-937-11	RES-CHIP	47	5%	1/16W
R1025	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1026	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1028	1-218-935-11	RES-CHIP	33	5%	1/16W
R1030	1-218-935-11	RES-CHIP	33	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R1031	1-218-935-11	RES-CHIP	33	5%	1/16W
R1032	1-218-935-11	RES-CHIP	33	5%	1/16W
R1033	1-218-933-11	RES-CHIP	22	5%	1/16W
R1035	1-218-933-11	RES-CHIP	22	5%	1/16W
R1037	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1038	1-218-990-81	SHORT CHIP	0		
R1039	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1040	1-218-937-11	RES-CHIP	47	5%	1/16W
R1041	1-218-937-11	RES-CHIP	47	5%	1/16W
R1042	1-218-935-11	RES-CHIP	33	5%	1/16W
R1043	1-218-990-81	SHORT CHIP	0		
R1044	1-218-933-11	RES-CHIP	22	5%	1/16W
R1045	1-218-933-11	RES-CHIP	22	5%	1/16W
R1046	1-218-933-11	RES-CHIP	22	5%	1/16W
R1047	1-218-933-11	RES-CHIP	22	5%	1/16W
R1048	1-218-990-81	SHORT CHIP	0		
R1049	1-218-990-81	SHORT CHIP	0		
R1050	1-218-990-81	SHORT CHIP	0		
R1051	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1052	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1055	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1074	1-218-990-81	SHORT CHIP	0		
R1078	1-218-990-81	SHORT CHIP	0		
R1082	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1083	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1084	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1085	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1086	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1088	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1089	1-218-941-81	RES-CHIP	100	5%	1/16W
R1090	1-218-990-81	SHORT CHIP	0		
R1094	1-218-990-81	SHORT CHIP	0		
R1098	1-218-933-11	RES-CHIP	22	5%	1/16W
R1099	1-218-933-11	RES-CHIP	22	5%	1/16W
R1102	1-218-990-81	SHORT CHIP	0		
R1154	1-218-933-11	RES-CHIP	22	5%	1/16W
R1166	1-218-933-11	RES-CHIP	22	5%	1/16W
R1169	1-218-990-81	SHORT CHIP	0		
R1175	1-218-990-81	SHORT CHIP	0		
R1186	1-218-990-81	SHORT CHIP	0		
R1188	1-218-990-81	SHORT CHIP	0		
R1189	1-218-990-81	SHORT CHIP	0		
R1906	1-218-990-81	SHORT CHIP	0		
R1907	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1909	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1910	1-218-990-81	SHORT CHIP	0		
R1913	1-218-990-81	SHORT CHIP	0		
R1914	1-218-990-81	SHORT CHIP	0		
R1915	1-218-990-81	SHORT CHIP	0		
R1916	1-218-956-11	RES-CHIP	1.8K	5%	1/16W
R1917	1-218-956-11	RES-CHIP	1.8K	5%	1/16W
R1921	1-218-990-81	SHORT CHIP	0		
R1922	1-218-990-81	SHORT CHIP	0		
R1923	1-218-990-81	SHORT CHIP	0		
R1927	1-216-864-11	SHORT CHIP	0		
R1929	1-218-990-81	SHORT CHIP	0		
R1930	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1931	1-218-990-81	SHORT CHIP	0		
R1932	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1933	1-218-953-11	RES-CHIP	1K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R1934	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1935	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1936	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1940	1-218-929-11	RES-CHIP	10	5%	1/16W
R1941	1-218-929-11	RES-CHIP	10	5%	1/16W
R1942	1-218-929-11	RES-CHIP	10	5%	1/16W
R1943	1-218-929-11	RES-CHIP	10	5%	1/16W
R1944	1-218-929-11	RES-CHIP	10	5%	1/16W
R1945	1-218-929-11	RES-CHIP	10	5%	1/16W
R1946	1-218-929-11	RES-CHIP	10	5%	1/16W
R1947	1-218-929-11	RES-CHIP	10	5%	1/16W
R1950	1-218-990-81	SHORT CHIP	0		
R1951	1-218-990-81	SHORT CHIP	0		
R1954	1-218-937-11	RES-CHIP	47	5%	1/16W
R1955	1-218-937-11	RES-CHIP	47	5%	1/16W
R1956	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1957	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1958	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1959	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1960	1-218-990-81	SHORT CHIP	0		
R1961	1-216-864-11	SHORT CHIP	0		
R1962	1-218-990-81	SHORT CHIP	0		
R1964	1-218-990-81	SHORT CHIP	0		
		< COMPOSITION CIRCUIT BLOCK >			
RB106	1-234-372-11	RES, NETWORK	100 (1005X4)		
RB107	1-234-372-11	RES, NETWORK	100 (1005X4)		
RB108	1-234-372-11	RES, NETWORK	100 (1005X4)		
RB109	1-234-372-11	RES, NETWORK	100 (1005X4)		
RB110	1-234-702-11	RES, NETWORK	68 (1005X4)		
RB111	1-234-370-21	RES, NETWORK	22 (1005X4)		
RB112	1-234-370-21	RES, NETWORK	22 (1005X4)		
RB113	1-234-370-21	RES, NETWORK	22 (1005X4)		
RB114	1-234-370-21	RES, NETWORK	22 (1005X4)		
RB115	1-234-370-21	RES, NETWORK	22 (1005X4)		
RB116	1-234-370-21	RES, NETWORK	22 (1005X4)		
RB117	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB118	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB119	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB120	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB121	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB122	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB123	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB124	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB142	1-242-963-21	RES, NETWORK	33 (1005X4)		
RB143	1-234-702-11	RES, NETWORK	68 (1005X4)		
RB144	1-234-702-11	RES, NETWORK	68 (1005X4)		
RB145	1-234-702-11	RES, NETWORK	68 (1005X4)		
RB146	1-234-702-11	RES, NETWORK	68 (1005X4)		
RB147	1-234-370-21	RES, NETWORK	22 (1005X4)		
RB148	1-234-370-21	RES, NETWORK	22 (1005X4)		
RB149	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB150	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB151	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB152	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB154	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB155	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB156	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB157	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		
RB158	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)		

Ref. No.	Part No.	Description	Remarks
RB159	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB171	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB172	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB173	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB174	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB175	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB182	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB183	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB184	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB185	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB189	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB190	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB191	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB192	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB193	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB194	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB195	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB196	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB201	1-234-372-11	RES, NETWORK 100 (1005X4)	
RB202	1-234-372-11	RES, NETWORK 100 (1005X4)	
RB203	1-234-372-11	RES, NETWORK 100 (1005X4)	
RB204	1-234-372-11	RES, NETWORK 100 (1005X4)	
RB205	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB210	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB211	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB212	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB213	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB219	1-234-702-11	RES, NETWORK 68 (1005X4)	
RB220	1-234-702-11	RES, NETWORK 68 (1005X4)	
RB221	1-234-702-11	RES, NETWORK 68 (1005X4)	
RB222	1-234-702-11	RES, NETWORK 68 (1005X4)	
RB223	1-242-962-21	RES, NETWORK 82X4 (1005)	
RB301	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB302	1-234-370-21	RES, NETWORK 22 (1005X4)	
RB501	1-234-379-21	RES, NETWORK 22K (1005X4)	
RB502	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB503	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB504	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB505	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB602	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB701	1-234-371-21	RES, NETWORK 47 (1005X4)	
RB702	1-234-371-21	RES, NETWORK 47 (1005X4)	
RB703	1-234-371-21	RES, NETWORK 47 (1005X4)	
		< SWITCH >	
S901	1-771-337-21	SWITCH, SLIDE (NOR-DL)	
		< VARISTOR >	
VDR901	1-805-774-21	VARISTOR, CHIP	
VDR902	1-805-774-21	VARISTOR, CHIP	
VDR903	1-805-774-21	VARISTOR, CHIP	
VDR904	1-805-774-21	VARISTOR, CHIP	
VDR905	1-805-774-21	VARISTOR, CHIP	
VDR906	1-805-774-21	VARISTOR, CHIP	
VDR907	1-805-774-21	VARISTOR, CHIP	
VDR908	1-805-774-21	VARISTOR, CHIP	
VDR909	1-805-774-21	VARISTOR, CHIP	
VDR910	1-805-774-21	VARISTOR, CHIP	

RD-064 POWER SUPPLY BLOCK

Ref. No.	Part No.	Description	Remarks
		< VIBRATOR >	
X201	1-813-210-11	VIBRATOR, CRYSTAL (NX5032GA) 25MHz	
X301	1-781-940-41	VIBRATOR, CRYSTAL 14.318MHZ	
* X701	1-813-695-11	VIBRATOR, CRYSTAL 24.576MHZ	
X801	1-781-867-21	VIBRATOR, CRYSTAL 27MHz	
X901	1-795-244-11	VIBRATOR, CERAMIC 10MHz	
⚠	1-474-022-11	POWER SUPPLY BLOCK (SRV-2001EK) **********	
		ACCESSORIES **********	
	1-479-557-11	REMOTE COMMANDER (RMT-D231P) (HX825)	
	1-479-558-11	REMOTE COMMANDER (RMT-D230P) (HX820)	
	2-658-476-01	COVER, BATTERY (FOR RMT-D231P/D230P)	
⚠	1-575-131-82	CORD, POWER	
	1-759-586-41	CONTROLLER, VIDEO (AV MOUSE) (HX825)	
	1-696-593-11	CORD, CONNECTION (PAL)	
	2-886-040-11	MANUAL, INSTRUCTION (FRENCH)(HX825)	
	2-886-040-21	MANUAL, INSTRUCTION (GERMAN)(HX825)	
	2-886-040-31	MANUAL, INSTRUCTION (ITALIAN)(HX825)	
	2-886-040-41	MANUAL, INSTRUCTION (DUTCH)(HX825)	
	2-886-040-51	MANUAL, INSTRUCTION (SPANISH)(HX825)	
	2-886-041-11	MANUAL, INSTRUCTION (PORTUGUESE) (HX820)	
	2-886-041-21	MANUAL, INSTRUCTION (DANISH)(HX820)	
	2-886-041-31	MANUAL, INSTRUCTION (SWEDISH)(HX820)	
	2-886-041-41	MANUAL, INSTRUCTION (FINNISH)(HX820)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Sony Corporation
Home Electronics Network Company

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